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Healthcare professionals' work with sickness absence - with focus on oncology

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**HEALTHCARE PROFESSIONALS' WORK WITH SICKNESS
ABSENCE – WITH A FOCUS ON ONCOLOGY**

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THESIS FOR DOCTORAL DEGREE (Ph.D.)

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ABSTRACT

Background: Physicians have an important role in patients' sickness absence (SA) process, and many initiatives have been taken to influence their sickness certification practice. Many physicians experience sickness certification as a problematic task. This also applies to oncologists, a group in which a larger proportion has sickness certification tasks more often compared to physicians with other specialties. Experiences of encounters with healthcare professionals is one factor that has been shown to be of importance regarding SA and ability to return to work (RTW) among sickness absentees in general. Breast cancer (BC) is the most common cancer among women of working age, however, knowledge about their experiences of encounters with healthcare professionals regarding SA and work is scarce.

Aim: To increase the knowledge about healthcare professionals' work with SA, how women with BC experience encounters with healthcare professionals, and possible associations with SA and RTW.

Method: In *study I-III*, data from three different Swedish surveys were analyzed. *Study I:* 342 oncologists who had sickness certification consultations were included. *Study II:* A cohort of 690 women in Stockholm, who had had surgery for primary BC, and were aged 24-63 years were included. *Study III:* A random sample of 6197 women in Sweden, aged 19-65 years, and on SA since 4-8 months were included. Of those, 187 were on SA due to BC. In *study I-III*, descriptive statistics were calculated, and logistic regression with odds ratios (OR) with 95% confidence intervals (CI) were used for analyses of associations. *Study IV:* A systematic literature review of interventions regarding physicians' sickness certification practices. Meta-analyses were performed to produce summarized relative risk estimates with 95% CI from the data pooled using random effect models.

Results: *Study I:* A majority of the oncologists had consultations involving sickness certification weekly and one fifth experienced such consultations as problematic at least once a week. Associations were found between oncologists stating not having enough organizational resources for work with such tasks and experiencing different aspects of sickness certification as problematic. *Study II:* A majority of the women with BC had experienced encounters regarding work with healthcare. An association was found both between women having experienced advice and support regarding work and having been encouraged to work and having less SA, as well as between to have been encouraged to be on SA and having more SA. The latter was partly explained by disease and treatment factors. *Study III:* Positive encounters with healthcare professionals in connection to SA were experienced by almost all the women on SA, both women with BC and with other SA diagnoses. About half of the women stated that positive encounters promoted their ability to RTW, slightly fewer among women with BC. Four specific types of encounters; "allowed me to take own responsibility", "encouraged me to carry through my own solutions", "made reasonably high demands", and "sided with me/stood on my side" were also experienced to a lesser extent by women with BC. *Study IV:* Nine intervention studies were included. The effect measures varied considerably. Significant intervention effects in intended direction were found in four of the nine interventions, in two interventions unintended effects were found. The meta-analyses indicated a summarized effect on any RTW (first, partial or full) among the patients.

Conclusion: Although oncologists often had sickness certification tasks, such tasks were seldom experienced as problematic. However, lack of resources for sickness certification tasks was associated with experiencing such tasks as problematic. Most of the women with BC had experienced encounters from healthcare professionals regarding work and SA the year after the surgery. Most of the women, both on SA due to BC or due to other diagnoses, had experienced positive encounters, and that such encounters promoted being able to RTW. The results indicate that physicians' sickness certification practice can be influenced by interventions.

SAMMANFATTNING

Bakgrund: Läkarna är centrala i patienters sjukskrivningsprocess och tidigare studier har visat att läkare upplever att vissa aspekter i arbetet med sjukskrivningar är problematiska. Detta gäller även onkologer, en grupp av läkare som oftare har sjukskrivningsärenden jämfört med läkare inom andra specialiteter. Många olika initiativ, såsom ändringar av regler eller förordningar, nationella och lokala riktlinjer, kurser i försäkringsmedicin etc. har genomförts för att öka kvaliteten i läkares arbete med sjukskrivningsärenden. Trots det är kunskapen begränsad när det gäller effekten av genomförda åtgärder. Hur långtidssjukskrivna personer upplever att de blivit bemötta av sjukvårdspersonalen har visat sig ha betydelse för deras sjukfrånvaro/återgång i arbetet. Om detta även gäller för kvinnor med bröstcancer, den vanligast förekommande cancerformen hos kvinnor i arbetsför ålder, finns det begränsad kunskap om.

Syftet med avhandlingen var att öka kunskapen om hälso- och sjukvårdspersonalens arbete med patienters sjukfrånvaro, hur kvinnor med bröstcancer upplever bemötande från sjukvårdspersonal, och om detta har samband med sjukfrånvaro och (återgång i) arbete.

Metod: I *studie I-III* analyserades svaren från tre olika enkätundersökningar. *Studie I:* Svar från en enkät som 2017 skickades till ca 34 000 läkare som då arbetade i Sverige. Av dessa arbetade 342 på hematologiska eller onkologiska kliniker (hädanefter kallade onkologer) och hade sjukskrivningsärenden åtminstone några gånger årligen. *Studie II:* Svar inhämtat från en enkät till 690 kvinnor i Stockholm, opererade för primär bröstcancer. Kvinnorna var i åldern 24–63 år när de inkluderades till studien under åren 2007 till 2009. Kvinnorna följdes prospektivt under två år bl.a. med sex olika enkäter. *Studie III:* Svar från en enkät utskickad 2013 till ett slumpmässigt urval av alla i Sverige som var 19–65 år, med ett sjukskrivningsfall som då pågått i 4–8 månader. Av de som svarade var 6197 kvinnor varav 187 var sjukskrivna i bröstcancer. I Studie I-III gjordes olika deskriptiva analyser samt sambandsanalyser avseende odds ratios (OR) med 95 % konfidensintervall (KI). Analyserna justerades för sociodemografiska och/eller medicinska data. *Studie IV:* En systematisk litteraturstudie som omfattade kontrollerade interventioner för att påverka läkares sjukskrivningspraxis. Meta-analyser genomfördes för att beräkna sammanvägda relativa risker med 95 % KI med ”random effects” modeller.

Resultat: *Studie I:* Majoriteten (92 %) av onkologerna hade sjukskrivningsärenden minst en gång i veckan och en femtedel upplevde sådana ärenden som problematiska minst en gång i veckan. Det fanns även ett samband mellan att onkologerna upplevde sig ha bristande resurser för arbetet med sjukskrivningsärenden och att de upplevde specifika aspekter av sjukskrivningsärenden som problematiska (range OR 2.3–4.3). *Studie II:* Majoriteten av kvinnorna som opererats för bröstcancer hade upplevt bemötande från sjukvårdspersonal gällande arbetsrelaterade frågor. Det fanns ett samband mellan att ha fått råd och stöd gällande arbete (OR 0.5: 95% KI 0.3–0.9) eller att ha uppmanats att arbeta (OR 0.6: 95% KI 0.3–0.9), och att i mindre utsträckning vara sjukskriven under andra året efter bröstcanceroperationen. Det fanns även ett samband mellan att ha uppmanats att vara sjukskriven och att vara det (Crude OR 1.6: 95% KI 1.1–2.4), även om detta delvis kunde förklaras av sjukdoms- eller behandlingsrelaterade faktorer. *Studie III:* Majoriteten (95 %) av kvinnorna som var sjukskrivna i bröstcancer och av de som var sjukskrivna i andra diagnoser hade upplevt positivt bemötande från sjukvårdspersonal i samband med sin sjukskrivning. En mindre andel kvinnor hade upplevt negativt bemötande ($\approx 20\%$). Hälften av kvinnorna, både bland dem med bröstcancer och med andra sjukdomsdiagnoser, svarade att positivt bemötande främjade deras återgång i arbete. Detta hade dock upplevts av något färre kvinnor med bröstcancer, likaså hade färre kvinnor med bröstcancer upplevt följande fyra typer av

positivt bemötande; ”låt mig ta eget ansvar”, ”stöttat mig att genomföra egna lösningar”, ”ställt lagom höga krav” och ”tagit mitt parti/ställt sig på min sida”. *Studie IV*: Nio interventionsstudier, inkluderades. Både innehållet i interventionerna och utfallsmåtten varierade avsevärt mellan studierna. Fyra av interventionerna visade på en statistiskt signifikant effekt av interventionen i avsedd riktning dvs. snabbare återgång i arbete, medan två av interventionerna visade på effekt i icke avsedd riktning dvs. förlängd tid till återgång i arbete. Meta-analysen indikerade en liten men signifikant sammanvägd relativ risk för samband mellan intervention och utfallet ”någon form av återgång i arbete” (första återgång, deltid eller full) (poolad RR 1.09; 95 % KI 1.00-1.19).

Slutsats: Sjukskrivningsärenden är en återkommande arbetsuppgift bland onkologer, och de flesta upplevde sällan denna uppgift som problematisk. Likafullt fanns ett samband mellan att uppleva brist på resurser och att arbetet med sjukskrivning av patienter upplevdes som problematiskt. De flesta av kvinnorna opererade för bröstcancer hade upplevt råd och stöd gällande arbetsrelaterade frågor från sjukvårdspersonalen, och det fanns ett samband mellan innehållet i bemötandet och kvinnornas sjukfrånvaro ett år senare. En stor majoritet av långtidssjukskrivna kvinnor med bröstcancer eller annan sjukdomsdiagnos, hade upplevt positivt bemötande från sjukvårdspersonalen i samband med sin sjukfrånvaro. De upplevde också i stor utsträckning att positivt bemötande hade främjat deras möjligheter till återgång i arbete. Resultaten från den systematiska litteraturstudien indikerade att läkares sjukskrivningspraxis kan påverkas av interventioner. De inkluderade studierna varierade dock avsevärt beträffande både innehåll och resultatmått.

LIST OF SCIENTIFIC PAPERS

- I. Söderman M, Wennman-Larsen A, Alexanderson K, Veronica Svärd, Friberg E. Physicians' experiences of, and prerequisites for sickness certification tasks at oncology clinics: a nationwide survey study. Submitted.
- II. Söderman M, Friberg E, Alexanderson K, Wennman-Larsen A. Women's experiences of encounters with healthcare professionals' regarding work after breast-cancer surgery and associations with sickness absence: a 2-year follow-up cohort study. *Supportive Care in Cancer*. 2019;27(4):1197-206.
- III. Söderman M, Wennman-Larsen A, Alexanderson K, Friberg E. Experiences of positive encounters with healthcare professionals among women on long-term sickness absence due to breast cancer or due to other diagnoses: a nationwide survey. *BMC Public Health*. 2019;19(1):349.
- IV. Söderman M, Wennman-Larsen A, Hoving JL, Alexanderson K, Friberg E. Interventions regarding physicians' sickness certification practices – a systematic literature review with meta-analysis. Manuscript.

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LIST OF ABBREVIATIONS

BC	Breast cancer
CG	Control group
CI	Confidence interval
DP	Disability pension
HR	Hazard ratio
IG	Intervention group
OR	Odds ratio
RR	Relative risk
RTW	Return to work
SA	Sickness absence
SIA	Social Insurance Agency
TNM	Tumor location and site, lymph node involvement, and presence or absence of metastases

1 INTRODUCTION

Physicians have a central role in the sickness absence (SA) process, not only through handling treatment etcetera, but also since they assess patients' work capacity and write medical certificates for SA (1). However, many physicians experience sickness certification as a problematic task (2-5). This is also the case among oncologists, a group where a higher proportion have sickness certification consultations more often compared to physicians with other specialties (2). Although many initiatives, e.g., changes of rules or regulations, national and local guidelines, insurance medicine courses, etc. have aimed to influence physicians' sickness certification practice, the knowledge is limited regarding the effect of such initiatives. There is a need for more knowledge regarding how physicians experience their sickness certification practice, and how that relates to interactions with their patients. Experiences of positive encounters regarding work, e.g., healthcare professionals being supportive, encouraging, and giving adequate information (6-8), have been shown to promote the ability to return to work (RTW) among long-term sickness absentees in general (9-14). Breast cancer (BC) is the most common cancer among women of working age and the survival rate is high (15, 16). This means that more knowledge is needed about their situation after the diagnosis both concerning how to handle SA and their RTW.

1.1 CONCEPTUAL FRAMEWORK

A conceptual model gives a visual picture of how different concepts relate to each other in a given context, and as an aid in an attempt to explain a phenomenon (17). Within the research field of SA, there are several models that aim to explain the relation between a specific SA diagnosis and work. The models might include aspects at different structural levels, e.g., society, healthcare system, patient, but also how different factors at different levels are related to each other. One model that includes factors at different structural levels and areas of relevance, is the so called Sherbrooke model or "the arena of work disability" (18). The model consists of a number of systems organized in layers, with a worker with disability in the middle of the arena. The model aims at providing a picture of the entire social structure and the stakeholders within each system; personal, workplace, healthcare, and compensation.

The framework for how different concepts are related to each other in this thesis is illustrated in Figure 1, a model modified from the "The arena of work disability". This modified model includes only two of the systems described in the original model, and only factors relevant in this thesis are included. In this thesis, the focus is on the *healthcare organization* including the *physicians / oncologists*, and *other healthcare professionals* who work with SA, and have encounters with the woman on SA. The focus is also on the *individual factors* of the woman on SA, including the *sociodemographics* and the *diagnosis- and treatment-related factors*. These factors are included since they might influence the chances of maintaining paid work, or the RTW process. As illustrated in Figure 1, woman on SA is depicted in the middle of the arena and surrounded by the *healthcare organization* and *individual factors*.



Figure 1. A model for the aspects in focus in this thesis, modified from “The arena of work disability” (18).

1.2 HEALTHCARE IN SWEDEN

In Sweden, according to the act of healthcare (19), the aim of the healthcare system is good health and healthcare on equal terms for the population. Further, according to the act, the healthcare system includes interventions to prevent, examine and treat diseases and injuries. Good healthcare means, among other things, that it must specifically meet the patient’s need for security, continuity and safety, to have respect for the patient’s self-determination and integrity, and to promote good contacts between the patient and the healthcare professionals. According to the patient security act, the healthcare system should promote a high patient safety and reduce adverse events (20). The management of healthcare is also responsible for systematic patient safety work, and has obligations for healthcare professionals, under the supervision of designated authorities.

Healthcare providers also have a responsibility from an insurance medicine perspective, regarding SA, for examination and assessment of work capacity, and care and treatment including medical rehabilitation (21). SA is a one of the recommended interventions within healthcare, and according to the National Board of Health and Welfare in Sweden, SA is a part of the care and treatment of patients (22). Healthcare professionals should include the patient in decision making, and contribute to the patient receiving adequate support in the SA- and rehabilitation process (20). The goal of medical rehabilitation is for the individual to achieve the best possible function as well as physical and mental well-being (21). In addition, healthcare professionals provide medical certificates to the Swedish Social Insurance Agency (SIA) and other stakeholders to be used by them for assessment of the right to SA, SA benefits, rehabilitation needs, and appropriate measures. A management system, working

with quality assurance and strategies for quality improvement are needed for good quality of healthcare.

1.2.1 The Swedish Social Insurance System – Sickness Absence

A welfare state has a number of programs set by the government, e.g., with the aim to maintain a social protection for the citizens in case of not being able to perform paid work when having work incapacity due to morbidity (23). The Swedish Social Insurance System can be classified as a general standard security model. Reimbursement for lost income can be paid in case of disease or injury that reduces work capacity to some level, after decisions made by the employer and/or the SIA based on physicians' medical certifications (24).

All individuals in Sweden aged 16 years or above who have a minimum level of income from work, unemployment benefits, or parental-leave benefit are covered by the Swedish Social Insurance System (24). SA benefits can be granted full time, 75%, 50%, or 25%, of regular work hours depending on the reduction in work capacity, covering about 80% of lost income up to a certain level. After the seventh SA day in a SA spell, a sickness certificate from a physician is needed, with information on the diagnosis/diagnoses leading to the work incapacity, which functional limitations it has led to, to what extent this affects the patient's activity and work capacity in relation to the work tasks of the patient. In addition, prognosis of the work capacity and measures to be taken during the SA are to be given. For employees, the first 14 days of a SA spell is compensated by the employer excluding one qualifying day, and from day 15 by the SIA. Unemployed and those on parental leave will receive compensation from the SIA from day 2. Self-employed can have different number of qualifying days. All people living in Sweden aged 19-64 can be granted disability pension (DP) if they have long-term or permanent work incapacity due to disease or injury. Similar to SA, DP can be granted for 100%, 75%, 50%, or 25% of regular working hours, covering about 64% of lost income up to a certain level. People with no previous income can receive DP benefits at basic level.

From day 91 of a SA spell, individuals' work capacity are to be evaluated against other work tasks at the same workplace, and from day 181 against work on the whole ordinary labor market. The right to sickness insurance benefits expires after 365 days, but exceptions can be made if it can be considered unreasonable to assess work ability in relation to work in the ordinary labor market, for example if the sick person is seriously ill.

In 2007, the National guidelines for sickness certification" (in Swedish "Försäkringsmedicinskt beslutsstöd") were introduced by the National Board of Health and Welfare, to aid physicians and SIA officers in their handling of sickness certification cases. These include both general guidelines (21), and diagnosis-specific guidelines regarding duration of SA, estimated work capacity and recovery time for about 100 diagnoses (25). In the context of oncology, the guidelines are so far only available for certain diagnoses, mainly for the major diagnose groups i.e. breast, prostate, colorectal, and lung cancer.

1.2.2 Measures of sickness absence and disability pension

A number of different measures of SA and DP have been used in studies on SA and/or DP in order to capture the complexity of these outcome measures with regard to recurring spells, skewed distribution, different duration, and varying prevalence (26-29). The many different ways (>100) used to measure those variables; reported sick, SA spells, duration of SA, RTW, degree of SA as part- or fulltime, needs to be considered when designing studies using data on SA (and DP), because different measures might give different conclusions.

1.3 PHYSICIANS' WORK WITH SICKNESS CERTIFICATION OF PATIENTS

Physicians have a central role in the SA process, since they are responsible for issuing certificates and what they state on the certificate is used as a basis for deciding whether the patient fulfills the criteria for being granted sick pay by the employer and SA benefits by a SIA officer (30). SA as a process includes the patient seeking healthcare when ill, assessment of work capacity, treatment, rehabilitation measures, and possible SA or RTW. Physicians from different specialties are involved in sickness certifying patients in many Western countries (3, 31-35), and in Sweden, all physicians, also oncologists, can write sickness certificates.

In Sweden, the sickness certification tasks include assessment of whether the disease or injury has resulted in functional limitations reducing the patients work capacity (1, 31, 36, 37). During the consultations the physicians should also discuss the pros and cons of SA with the patient, consider the duration, grade (full- or part-time), the need of referrals, collaboration with others within and outside of the healthcare system, make a plan of action for what is to take place during the SA, write a sickness certificate, and document the actions taken (1, 31). In general, physicians have two roles in the sickness certification consultations; as the patient's treating physician, and as a medical expert for other authorities as, e.g., employers and the SIA (1, 31, 36-38).

1.3.1 Physicians' experiences of sickness certification tasks

Physicians have previously reported that they experience several tasks in the sickness certification process as problematic, one example is assessing level of work capacity of patients who have reduced function due to injury or disease (2-5, 39, 40). Other areas experienced as problematic are lack of competence (i.e., knowledge, skills, and attitudes) concerning sickness certification/insurance medicine, handling the two roles as the patient's treating physician and as a medical expert writing certificates, handling situations when the physician and patient disagree on the need for SA, and cooperating with other stakeholders in SA cases (1, 39, 40).

In Sweden, the healthcare professionals are responsible for performing their work tasks according to regulations (20). The responsibility for having organizational prerequisites for these tasks however belongs to the operational managers (41). How managers work with

issues concerning sickness certification varies, but the work should include developing the organizational prerequisites(42).

1.3.2 Sickness certification in the context of oncology

In the few existing previous studies on sickness certification in the context of oncology, oncologists have reported more frequently having sickness certification consultations than, e.g., general practitioners (Figure 2) (2, 5, 38, 43). In a Swedish report from 2017, it was found that 45% of general practitioners and 61% of oncologists, respectively, had sickness certification consultations at least 6 times a week, but these consultations were perceived as problematic by 57% of the general practitioners and 15% of the oncologists (38). Although they seldom experience such consultations as problematic (5, 38, 43), they have reported that their main problem concerning sickness certification was how to assess their patients' work capacity (2). Thus, more knowledge is needed in order to support oncologists in sickness certification tasks.

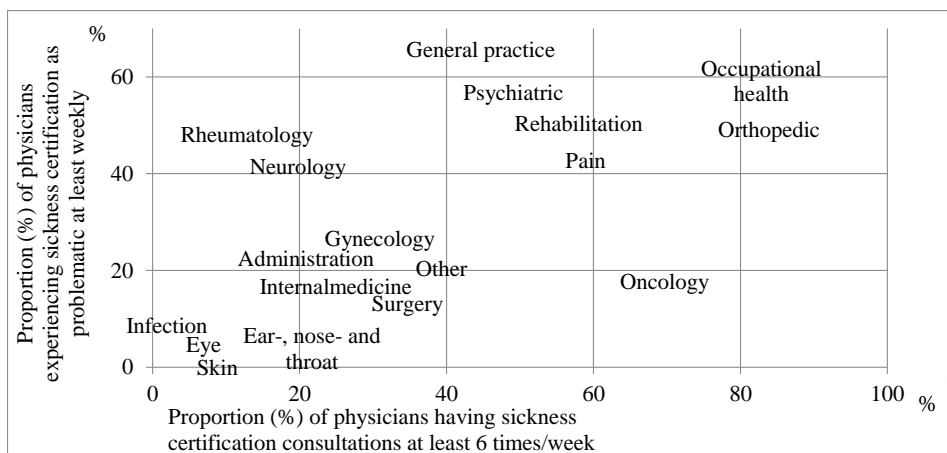


Figure 2. Physicians working in different types of specialties, having sickness certification consultations at least 6 times/week and experiencing them as problematic at least once a week (N=13 750) (38).

In Sweden, a national cancer strategy (44) with focus on a holistic perspective on cancer was introduced in 2009, in addition to the National guidelines for treatment of several cancer diagnoses (25). The strategy includes both primary prevention, early detection, diagnostics, treatment, palliative care, and improvement of knowledge. The National guidelines for cancer rehabilitation (45), were developed as a result of the national strategy. They include guidelines for rehabilitation measures during the process of diagnosis, and treatment, as well as psychosocial aspects, e.g., anxiety and coping strategies etc., and also guidelines regarding issues related to insurance medicine. According to the guidelines, the goal of the cancer

rehabilitation with regard to insurance medicine, is that the patients should be able to work as much as the disease and treatment allows, and that SA should be considered due to possible functional limitations leading to work incapacity.

According to the guidelines, cancer rehabilitation measures should be provided by multi-professional teams (45). Such teams should include: an oncologist, a contact nurse, a hospital social worker, a psychologist, a physiotherapist, an occupational therapist, a dietician, and potentially other professions depending on the specific tumor site, and/or a professional with a coordination function. In Sweden, the organization of these teams might differ due to local prerequisites. For contact nurses there is however a general description about responsibility (46). The contact nurse has an overall responsibility for the patient and for contacts with his/her relatives throughout the process. The task includes being responsible for coordination of care, being accessible, to set up care plans, informing about the next steps in care and treatment, providing support for normal crisis reactions and supporting contacts with other professional groups.

1.4 HEALTHCARE PROFESSIONALS' ENCOUNTERS WITH PATIENTS

A professional encounter (in Swedish "bemötande") with patients is expected to be a good encounter or an encounter which both the healthcare professionals and the patients describe in positive terms (47). The bases for such encounters among healthcare professionals are generally facilitated through professional training and having organizational prerequisites that support positive encounters, but they can also be further developed through patient-relations and experience.

1.4.1 Model for how encounters might influence sickness absence

One aspect of this thesis is how patient's experience being encountered by healthcare professionals and how this might influence their SA or RTW. There are several different theoretical models for how such experiences could be of importance for SA or RTW. One such model is described in Figure 3. The model is based on theories of social emotions such as pride and shame, emotions that have been discussed as relevant in research on RTW among sickness absentees (48). The sickness absentees' experiences regarding the social interaction in connection to the SA process leads to self-evaluation which contributes to emotions of pride or of shame. These emotions, in turn, can contribute to the sickness absentee experiencing psychological empowerment or disempowerment, as described in Figure 3. Emotions of pride often gives energy and capacity to act. Emotions of shame often takes energy and leads to inactivity. Both empowerment and disempowerment can be related to work capacity and health. Thus, experiences of the emotions pride and shame might also influence the RTW process of the sickness absentee. Further, interview studies have shown that the sickness absentees' narratives about encounters are associated with strong emotions, emotions that are often described as leading the sickness absentee taking different actions or standpoints (6, 9, 48). The show how encounters experienced as positive or negative could affect SA processes among sickness absentees as presented in Figure 3.

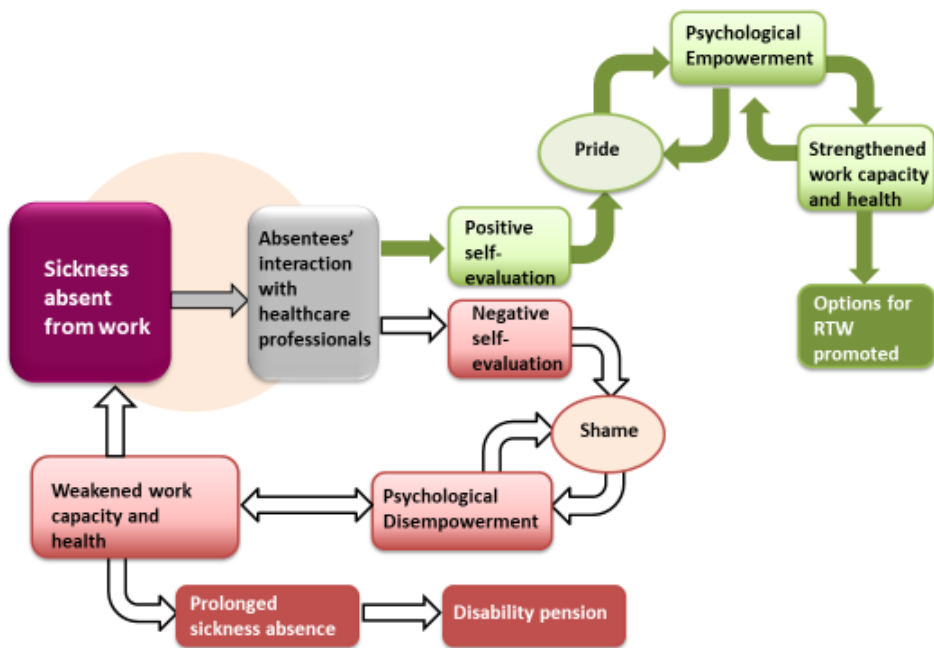


Figure 3. Hypothetical relationships between encounters, social emotions, psychological empowerment, health, and return to work among sickness absentees (6, 9, 48).

1.4.2 Sickness absentees' experiences of encounters with healthcare professionals

Several studies have investigated how patients experience encounters with healthcare professionals in general, however, there is a limited number of studies on how sickness absentees experience such encounters. One such study found that sickness absentees' experiences of encounters with healthcare professionals where the encounter was characterized by professionalism, knowledge, continuity, and a holistic approach were experienced as creating trust between the sickness absentee and the professional (10). Some studies have explored sickness absentee's experiences of specific types of positive and negative encounters (49-51), and one study showed that a majority had experienced positive encounters with healthcare professionals, including aspects of being treated with respect and being listened to (6). A minority of sickness absentees had also experienced negative encounters with healthcare professionals, such as disrespectful encounters, being questioned (11, 52, 53), or being wronged (49, 54). The experience of negative encounters might have mental, social, as well as occupational consequences (7).

1.4.3 Sickness absentees' experiences of encounters regarding work

In previous studies on sickness absentees concerning factors promoting or hindering RTW, it has been observed that the experiences of encounters with healthcare professionals are

important (6, 55) for the sickness absentees' RTW. Sometimes these encounters are experienced as having equal importance as the rehabilitation measures taken. Aspects of encounters regarding work have in previous studies been described in different ways, in a more general way as an interaction between the sickness absentee and the professional (7) or more specifically as experiencing that the professionals are being supportive, encouraging (6), and giving the sickness absentee useful information regarding work issues (56).

Sickness absentee's experiences of encounters have in some studies been related to their ability to RTW (6, 8, 9, 11, 12, 49-54, 57-59). Specific types of positive encounters have been shown to promote the ability to RTW among patients (9-14), e.g., healthcare professionals listening to patients and offering helpful support during the period of recovery (52) or believing in the sickness absentees' work capacity (58). There are also studies showing that patient's experiences of interactions with healthcare professionals regarding work issues could be a contributing factor promoting RTW for sickness absentees with specific diagnoses, such as, heart failure, musculoskeletal pain, mental disorders, cancer in general, and injuries (10, 14, 54, 57, 58, 60-63). Some previous studies have observed that sickness absent women experienced negative encounters from professionals more often men (53, 63).

When encounters are discussed in this thesis, encounters with healthcare professionals regarding both work aspects and regarding different aspects of SA are covered.

1.5 PAID WORK AND HEALTH

The labor market participation is high in Sweden (64). In 2018, about 82% of all people of 20-64 years and 80% of the women in those ages were in paid work (part- or full-time), as employed or self-employed. The corresponding number for women in all of the EU was 67%. In Sweden, women in higher ages, 55-64 years, also have a high employment rate compared with women in EU, 76% versus 52%. Previous studies have however shown that women have higher probability to be on SA compared to men (24, 65).

Paid work is an activity where people spend much of their time, and it is an important source of meaning in life (66). According to previous research, work can also be considered as something that leads to health, since it gives the individual financial independency and psychological well-being (67). Besides that, it is also a source of identity, it provides a role in life, and social status. Work has also been shown to have direct health effects, it can protect against depression and common mental disorders (68). RTW after SA has been shown to improve the individuals' self-esteem, physical function, and finances (67). RTW after SA has been shown to have beneficial health effects, sickness absentee's health was improved when they returned to work (69), and their distress was reduced (67). In addition, patients' health has been shown to decline with unemployment, and this was seen irrespective of time and context (67). Different possible side effects of SA have also been observed in the last decades (70, 71).

1.5.1 Sickness absence in Sweden

In Sweden, the SA levels have fluctuated much over time since the general public SA insurance was introduced in 1955 (72, 73). After a dramatic decrease in SA rates from 2003 and until to the lowest ever in Sweden in 2010, SA recently increased somewhat again. The distribution of sickness absence benefits is uneven between women and men, in 2018 the numbers were 64% women vs 36% men (24). There are also some differences between men and women regarding SA diagnoses regardless of age, e.g., in 2018 more women were on SA due to mental disorders while more men were on SA due to musculoskeletal diagnoses. Cancer is the third most common SA diagnosis for ongoing cases after mental disorders and musculoskeletal diagnoses among women and the fourth most common among men – among them injuries is the third most common SA diagnosis (74).

1.5.2 Work and cancer

In year 2018, the global burden of cancer was about 18 million cases and 9.6 million deaths, and about 5.6 million people of working age were diagnosed with cancer in the world (15). Despite cancer site and cancer-related symptoms, factors such as age, educational level, and occupation are of importance for RTW (75, 76) and functioning at work after RTW (77) among cancer survivors of working age.

Many cancer survivors describe how the disease and treatment have forced them to leave their full-time work, but that they still have a desire to return to some type of meaningful activity or paid work (78). They also describe that RTW is an important part of their recovery (79), and that paid work give them a daily structure. Work is also experienced as beneficial by giving feelings of competence and having control, and also by being protective against depressive emotions (78).

Employers' willingness and ability to provide support can both be a facilitator and a barrier for RTW among cancer survivors (80). Factors such as communication, work environment, discrimination, and the individuals' perception of their work capacity are of importance for ability to RTW. Cancer survivors might experience limitations in work capacity due to cognitive dysfunction, fatigue, anxiety, depression, or not having successful coping strategies (81, 82). There are also other factors which may impact differently short- and long-term, e.g., employers and co-workers may offer support and tolerance at the time for diagnosis and initial treatment but this might decline with time (81).

The Swedish national cancer strategy states that a specific attention should be paid to the patient's perspective (44). That means, that healthcare in each individual case should be based on the individual patient's needs, conditions and values. Such approach should guide the healthcare provider during the SA process of the cancer survivor and set focus on important factors concerning personal characteristics, psychological and physical aspects, as well as treatment related, workplace related, and the patients' needs regarding administrative aspects including regulations and finances.

1.6 BREAST CANCER

BC is the most common cancer among women in working ages and the survival rate is high (15, 16). There are also men diagnosed with BC, but they are few, and not included in the studies concerning BC in this thesis. Most of the women are not on SA at the time of the diagnosis since they do not have any symptoms of their BC before surgery, as the tumor is often found through screening for BC (83). In Sweden, half of the women with BC are of working age (16). This means that more knowledge is needed about the whole life situation for these women, including consequences for their working life, SA and DP, a field that is still sparsely researched.

1.6.1 Incidence and prevalence

BC is the most frequent cancer among women globally (15, 84), and in Sweden around 9700 women are diagnosed with BC yearly (16). Incidence varies across countries (15) but also within countries, e.g., more women in larger cities are diagnosed with BC (16). Lifestyle factors such as high-calorie diets with animal fat and protein, reproductive patterns with late menarche and late first delivery or nulliparous, as well as use of hormonal products increase the incidence (83). The current five-year survival rate is 90% and 10-year survival rate is 80% in more developed countries, but can vary by stage of cancer at diagnosis (15, 84).

1.6.2 Diagnosis and treatment

A BC can be detected both by clinical signs such as changes in the breast tissue or by imaging methods as mammography and ultrasound. In accordance to EU recommendations for screening of BC, mammography should be offered to women 50-69 years of age (85), and in Sweden all women 40-74 years are offered mammography (86). Stage of the BC at diagnosis is based on the anatomical staging system: tumor location and site, lymph node involvement, and presence or absence of metastases (TNM) (87). The prognosis for BC is good since many women are diagnosed in early stages as a result of screening, but also by advances in treatment (83).

Breast conserving surgery is more common than mastectomy, and sentinel lymph node biopsy is more common than axillar clearance (83). In many cases radiation therapy followed by chemo-, hormone- and targeted therapy, are recommended after surgery in order to decrease relapse. This depends on type of BC, and should be based on the benefits for the individual woman. According to both Swedish and EU recommendations, treatment should be provided by a multi-professional team and with support from a special trained nurse at breast units (85, 88).

1.6.3 Consequences of disease and treatment

When recommending specific types of treatment, the physician should balance treatment efforts with known possible short- and long-term side effects (85). Complications that women with BC often experience following surgery are: lymphedema (89-91), pain in the chest wall or axilla (90-92) and functional limitations in arm and/or shoulder (92, 93). Those who have

undergone mastectomy and/or a breast reconstruction may also experience problems related to stigma of mastectomy and an altered body image (94), especially in women at younger ages (95). Consequences of the implant are that there is a risk for rupture or leak from the implant (90). During adjuvant treatment, women with BC have frequently reported symptoms such as nausea and vomiting caused by chemotherapy (90, 96), skin irritations caused by radiation (97), and skin toxicities caused by targeted therapy (98). There is also an increased risk for cardiovascular diseases caused by adjuvant treatment (90, 91, 99). Fatigue and exhaustion are frequently reported symptoms (100, 101), and menopausal symptoms induced either by chemotherapy or hormonal therapy are common side-effects of the treatment (90, 91, 96).

Concerning the long-term side-effects, women with BC have reported symptoms even ten years after treatment cessation, including fatigue, mild cognitive impairment (102), and depressive- (91, 102-104) or anxiety symptoms (102, 104).

1.6.4 Breast cancer and paid work

Women diagnosed with BC (105), similar to cancer survivors in general (79), experience that RTW is an important part of their recovery. Several studies show that being in paid work as well as the vocational satisfaction is a very central part of the life of women of working age diagnosed with BC (106-112). Women with BC have, however, the longest time to RTW compared with women with gynecological, head and neck, and urological cancer (113). The prevalence of RTW among women with BC varies widely between countries from as low as 43% in the Netherlands to up to 93% in the USA (114-120). The challenges for RTW, e.g., late effects of treatment and encounters with employer and colleagues have shown to be similar in international perspective (121).

Results regarding factors of importance for workability have been widely reported (122). More advanced BC, lymph node involvement and Her2-positive tumors (123, 124) have shown to be contributing factors for lower workability, however, a Swedish study showed loss in working years also in early-stage BC (125). Moreover, it has been shown that healthcare professionals' encounters regarding work-related issues with patients, both in general and with women with BC specifically, have significance for the extent to which they work or are on SA (109, 110).

1.6.4.1 Individual factors associated with (return to) work

Treatment-related factors influence SA during the first year after surgery (85, 120), and are observed to be most pronounced in women undergoing mastectomy, chemo- or hormonal therapy (119, 123, 126-129). The most important factor shortly after BC surgery has been found to be nausea and vomiting as a side-effect to chemotherapy (93, 107, 115, 127), followed by more advanced surgery (93, 100, 119, 127-130), and arm morbidity after lymph node dissection (93, 115, 123). Other factors observed are skin irritations as side-effect to radiotherapy, lymphedema as complication after surgery (115, 131, 132), fatigue (106, 115, 133, 134), as well as functional impairments (135). However, according to one study among

women with BC in Singapore one year after the diagnosis was set, tumor and treatment characteristics were not associated with workability except for arm symptoms (136).

Previous research has shown variations between individual women with BC where some desire to RTW as it increases their sense of, e.g., wellbeing, while some state a need to have time for recovery (105, 137). Further, some women need adjustments at the workplace while others do not want to disclose the disease to others at the workplace (138). According to previous research on sociodemographic factors: women of younger age (120, 132, 139), with higher socioeconomic status, i.e., educational level (115, 117, 120, 139-141), occupational class (142) and income (119, 120, 139) are more likely to RTW. However, other studies have shown that women in younger age groups (124, 129) and with the highest education were less likely to RTW (124). Regarding marital status as well as those who were immigrants, the results are ambiguous (117, 120). There is research showing that unmarried or widowed women were more likely to RTW (115), but also that marital status was not associated with RTW (127). Some studies have shown that women from minorities or with immigrant background were less likely to RTW (133, 143, 144), whereas other studies have not shown that ethnicity was associated with RTW (115). Another aspect that has been found to promote RTW among women with BC, is reporting good health (115, 124). Further, those with lower physical quality of life, pain (141) or who rate their health as lower (136) also have lower workability. While women practicing physical activities were more likely to RTW (140).

1.6.4.2 Social factors associated with (return to) work

Working conditions such as psychological and organizational constraints (130) and part-time employment (117) have been seen to be negatively associated with RTW both in a short- and long-term perspective for women with BC (145). Since symptoms from the disease and treatment could lead to difficulties to perform work tasks extending the time to RTW, there might be a need of adjustments at the workplace, to working conditions, or working hours (122, 146-148). Three studies have shown that among women with BC, workplace adjustments tended to promote RTW (113, 119, 149). As one conclusion in a review, the authors suggest that professional expertise might be needed to make risk assessments at respective work place (146). Receiving support from relatives (106, 115, 150) or from colleagues (106, 115, 151) has also been seen to promote RTW among some women with BC.

1.6.4.3 Experience of encounters regarding work among women with breast cancer

Work has been shown to be important for women with BC also during SA. So far, only few studies have been conducted concerning women with BC experiences of aspects influencing RTW, besides sociodemographic, disease- or treatment-related factors (116, 147, 152-156).

Women with BC have contact with various stakeholders such as healthcare professionals and social security officers (147). One study found that women with BC experienced that healthcare professionals' attitudes about RTW was an important aspect influencing their RTW (147). To receive support from different stakeholders, such as employers, physicians,

and insurance officers, regarding concerns that the women with BC had about RTW was also observed to contribute to the women's RTW (147, 154). The women who received useful work-related advice and support were shown to have lower risk for experiencing decreased physical or psychological working capacity compared to before the BC diagnosis (153). Further, to receive adequate information and guidance in work-related issues were shown to promote RTW among women with BC (116, 130). Even if women receive a large amount of different types of information during the disease trajectory, information regarding work might be scarce (155) or not targeted to the needs of the women with BC (155).

1.7 RETURN-TO-WORK INTERVENTIONS IN THE HEALTHCARE CONTEXT

In order to limit long-term SA and its consequences for health, working life, social life, lifestyle, and emotional aspects, interventions to facilitate RTW have been introduced. Except for using different types of designs, e.g., RCT, CT, or before/after measures, the interventions can also be described by type as simple or complex (157). Complex interventions can be defined as having several professionals delivering the intervention on several structural levels, and/or the interventions consisting of several components (158). Evaluation of complex interventions' effect might be challenging since it is not always obvious which component is the one giving the effect, or whether there are interactions between different components leading to the effect. Complex interventions within healthcare can include coordinated efforts including several structural levels, i.e. the organization, healthcare providers and patients, or the efforts could be on the individual level for the professional or the patient (159).

1.7.1 Interventions targeting sickness absentees

The content of interventions targeting sickness absentees varies, such as several types of therapies, ergonomics at the workplace and education (159). There is some research from multidisciplinary team interventions concerning rehabilitation measures for diagnoses as low back pain showing clinically relevant effects on RTW (160). Similarly, improvement in RTW was observed for interventions targeting patients with different types of cancer, especially newly diagnosed patients (111). Further, work-oriented interventions targeting people with depression have been shown to decrease number of days on SA (161) while interventions targeting sickness absentees with musculoskeletal and/or non-specific mental problems did not show significant effects on RTW (159). There is also some research on interventions aimed at women with BC, but since the interventions differ both in terms of goals and approaches, there is a need for, both better and more, multicomponent interventions based on current evidence of factors contributing RTW (120).

1.7.2 Interventions targeting healthcare professionals

Interventions targeting healthcare professionals, e.g., from a patient-centered care perspective, have been carried out in various contexts resulting in an improvement of the healthcare professionals' encounters with patients (162). Interventions targeting healthcare professionals concerning issues related to RTW and more specific physicians' sickness

certification practices, have on the other hand mostly been conducted within primary care (1), even if physicians in other clinical settings also ask for training and support in sickness certification practice (43).

The costs of SA for the society, i.e., productivity loss, healthcare use and efforts to get the sickness absentee back to work (163) have led to a great number of interventions aiming to improve physician's sickness certification practices in many Western countries (164), so also in Sweden. There have been several interventions in the last decade with the objective to strengthen the support for physicians working with sickness certification tasks (38, 165). In Sweden many interventions have been conducted as a result of an agreement between the state and Swedish Local Authorities and Regions in 2006. The aim of the agreement was to stimulate prioritization of the management in SA issues and development of the SA process (166). The interventions include attempts to strengthen the leadership among managers, to implement strategies for competence development in insurance medicine, strategies for internal and external cooperation with others, and for the clinics to establish joint routines. However, the knowledge is limited regarding the content and effects of these interventions and the interventions are seldom scientifically evaluated.

In previous studies of interventions on physicians' sickness certification practices some improvements have been found. Improvements were found regarding adherences to and knowledge about guidelines for assessment of work capacity (167), competence in managing work-related issues (168), change in attitudes regarding RTW issues (34), and experienced value of an instrument for assessment of work capacity (169), both more completeness of and decrease in amount of sickness certifications (34). The wide range of designs, contexts and outcomes in these studies reflects the complexity in physicians' sickness certification tasks and praxis. Further, a previous review has shown that there is a need of more and better interventions and international comparisons in order to produce evidence for improving physicians' sickness certification (1).

1.8 SUMMARY AND NEED FOR FURTHER KNOWLEDGE

Although there have been many interventions aimed at improving physicians' sickness certification of patients, knowledge is still limited regarding contents and effects of such interventions. Such knowledge is even more limited regarding oncologists. In order to develop relevant support for oncologists in their work with sickness certification consultations, more knowledge is needed regarding the oncologists' experience of such consultations and the effect of interventions aimed at sickness certification practice. Moreover, exploring oncologists' experiences of organizational prerequisites for sickness certification may cover some of that knowledge gap. Healthcare professionals' encounters of patients, e.g., being supportive and encouraging, is one factor that has been shown to be of importance regarding SA and ability to RTW for patients in general, and for patients with specific diagnosis (9, 10, 14, 54, 56-58, 60, 63, 170). However, there are only few studies concerning this topic among women with BC. According to these studies, providing adequate information and guidance in work-related issues (116, 156), and healthcare professionals'

attitudes about RTW (147), are of importance for SA and RTW among women with BC. There is, however, still a lack of knowledge regarding experiences of encounters regarding SA and work with healthcare professionals among women with BC, and whether such encounters affect RTW. Furthermore, there is also lack of knowledge about possible differences regarding experiences between women with BC and SA due to other diagnoses.

Thus, in this thesis the focus was on healthcare professionals' work with SA, and the influence of this on SA and RTW among patients. This includes also oncologists' experiences of organizational prerequisites for sickness certification consultations, and experiences of encounters among both women on SA due to BC and due to other diagnoses in relation to SA and work.

1.9 CATEGORISATION OF INCLUDED STUDIES

The project can be categorized in a structure as shown in Table 1, which clarifies the project, and facilitates comparison with other studies within the field of insurance medicine. Perspectives taken in my thesis are marked in bold.

Table 1. A structure for categorization of studies of sickness absence/disability pension.

What is studied?	-Study design -Type of data -Analyses	Scientific discipline	Perspective taken in the research questions	Studied	Structural level of the factors included in the analyses	Diagnoses
1. Occurrence of sickness absence/disability pension	<u>Study design</u> -Systematic literature review -Cross sectional -Longitudinal -RCT, CT, etc.	Economy (health economy) Epidemiology Law Management Medicine (insurance medicine, psychiatry, occupational health, social medicine, healthcare science, public health etc.) Philosophy Psychology Social work Sociology Other	That of the: -Society -Insurance -Healthcare -Employer -Family -Patient	General population Insured In paid work (general or special jobs/organizations) Diagnosed/patients Sickness absentees	-National -Local -Worksite -Health care -Family -Individual	All together Mental (all or specific) Musculoskeletal Cancer, breast MS Hearing CVD Infections Injuries Diabetes Etcetera
2. Factors that hinder or promote sickness absence/disability pension	<u>Type of data</u> Interview					
3. Factors that hinder or promote return to work	Questionnaire Register Medical files Insurance files Certificates Documents Observations Video Other: published articles			Organizations Professionals, healthcare Countries		
4. "Consequences" of (being on) sickness absence/disability pension						
5. Sickness certification practice	<u>Type of analyses</u> -Qualitative -Quantitative					
6. Methods, theories						

2 AIMS

2.1 OVERALL AIM

The overall aim of this thesis was to increase the knowledge about healthcare professionals' work with SA, how women with BC experience encounters with healthcare professionals, and possible associations with SA and RTW.

2.2 SPECIFIC AIMS

- I. To explore oncologists' experiences of organizational prerequisites for sickness certification tasks, and if lack of resources is related to experiencing sickness certification as problematic.
- II. To explore if women had experienced encounters regarding work from healthcare professionals during the first year after BC surgery and if this was associated with SA during the second year after surgery, controlled for treatment and sociodemographic effects.
- III. To gain knowledge on the experiences of encounters with healthcare professionals and the ability to RTW among women on long-term SA due to BC compared with women on long-term SA due to other diagnoses.
- IV. To obtain more knowledge about interventions regarding physicians' sickness certification practice and the possible effect, in terms of SA or RTW among their patients.

3 DESCRIPTION OF THE STUDIES

Table 2. A description of the study I-IV including an overview of the main results.

	Study I	Study II	Study III	Study IV
Title of the study	Physicians' experiences of and prerequisites for sickness certification tasks at oncology clinics: a nationwide survey study	Women's experiences of encounters with healthcare professionals regarding work after breast-cancer surgery and associations with sickness absence; a two-year follow-up cohort study	Experiences of positive encounters with healthcare professionals among women on long-term sickness absence due to breast cancer or due to other diagnoses	Interventions regarding physicians' sickness certification practice – a systematic literature review with meta-analysis
Aim	To explore oncologists' experiences of organizational prerequisites for sickness certification tasks, and if lack of resources was related to experiencing sickness certification as problematic	To explore if women had experienced encounters regarding work from healthcare professionals during the first year after BC surgery and if this was associated with SA during the second year after surgery, controlled for treatment and sociodemographic effects	To gain knowledge on experiences of encounters from healthcare professionals and how that influenced ability to RTW, among women on long-term SA due to BC and among women on long-term SA due to other diagnoses	To obtain more knowledge about interventions regarding physicians' sickness certification practice and to summarize their possible effects, in terms of SA or RTW among patients
Included	342 physicians working at oncology clinics, 24-68 years old	690 women with BC surgery aged 24-63 years when diagnosed	6197 women aged 19-65 years on long-term SA (187 with BC)	12 peer reviewed publications from 9 unique studies
Data Sources	Questionnaire, The National Board of Health and Welfare	Questionnaire, medical records, national BC register, SIA	Questionnaire, Statistics Sweden, SIA	Published intervention studies regarding physicians' sickness certification practice
Analyses	-Descriptive statistics -Logistic regression	-Descriptive statistics -Logistic regression	-Descriptive statistics -Logistic regression	-Descriptive -Meta-analysis
Outcome	-Experiencing sickness certification tasks as problematic -Not having enough resources for sickness certification tasks	SA and DP in year two after BC surgery	Associations of experiences of positive encounters with healthcare professionals on ability to RTW	SA or RTW among sickness absentees
Main findings	A minority of the oncologists' experienced sickness certification as problematic, but not having enough resources was associated with such experiences	Most women with BC surgery had experienced encounters regarding work, and there was an association between type of the encounter and the outcome, SA, two years after BC surgery	Most women had experienced positive encounters with healthcare professionals. Experience of specific types of positive encounters was associated with having experienced that positive encounters had promoted ability to RTW among women with BC	The meta-analysis indicates a small overall effect on any RTW. Physicians' sickness certification practice might be influenced by interventions in both intended and non-intended direction

NOTE BC, breast cancer. RTW, return to work. SA, sickness absence. SIA, Social Insurance Agency.

4 MATERIAL AND METHODS

This thesis is based on findings from four studies based on four different data sources; three different surveys and one systematic literature review including meta-analyses. In the surveys, questionnaire data was linked with data from nationwide registers and/or medical records. Detailed description of data used and methods are found under each study, respectively.

Study I-III have all been approved by the Regional Ethical Review Board in Stockholm, Sweden. Study I Dnr 2012/689-31/5; Study II Dnr: 2012/2021-31/5; Study III Dnr: 2007/612-31/4, 2009/1623-32, 2013/713-32, 2014/1874-32.

4.1 MATERIAL

4.1.1 Study I

In this study, focus was on physicians working at oncology or hematology clinics irrespective of the level and type of specialty training (hereinafter referred to as oncologists). There was an interest in studying oncologists since they as a group, compared to physicians with other specialties, have sickness certification consultations more often but they have been observed to experience them less often as problematic (38).

A cross-sectional nationwide study was conducted, based on data from a questionnaire sent to most physicians working and living in Sweden. The physicians were identified through the Swedish Healthcare Address Register, held by QuintilesIMS and based on the Swedish National Board of Health and Welfare's register of healthcare professionals. The questionnaire, open for responders between May through October 2017, was sent to the home addresses of all 34 585 physicians aged ≤ 68 years and living and working in Sweden at that time, with exception for specialists working in clinics where sickness certification does not occur regularly, e.g., geriatrics, pediatrics, and laboratory clinics, who were not invited. Four reminders were sent to non-responders. In total, 18 714 physicians answered the questionnaire (54.4%), most of them submitted their responses electronically (57.5%), the rest by paper.

In this study those 342 physicians were included who stated that they mainly worked as oncologist and having sickness certification consultations at least a few times a year. Information about age and gender was obtained from Statistics Sweden and year of graduation from the National Board of Health and Welfare. The research group received anonymized data from Statistics Sweden, which both administrated the survey and conducted non-responder analyses.

The questionnaire, containing 133 questions, was based on previous interview studies (individual and focus groups) (171, 172), previous such surveys (2, 4, 37, 43, 173-175), and literature reviews (1, 40) about physicians' sickness certification practices. In the analyses, background characteristics, answers to questions regarding experiences of sickness

certification consultations and organizational prerequisites for such consultations, were included. The included items and how the items have been categorized or dichotomized in the study, are described in detail in the manuscript for Study I.

4.1.2 Study II

In this study, the perspective was changed, from oncologists to women of working age with a first diagnosis of BC. The interest was in how women with BC experienced encounters where work was discussed with both oncologists and other healthcare professionals.

The study design was a prospective cohort study. The inclusion period was from 19 March 2007 to 18 November 2009, and it ended when the intended number of women based on the power calculation had been included. Women (n=970) were consecutively invited to take part in the study at their first visit at the clinic for planning further treatment occurring four weeks after their first BC surgery. Of those, 173 women chose not to participate and 48 women were missed due to administrative oversights, in total 749 (81.2%) of those invited consented to participate. The baseline questionnaire data were collected at the time of the inclusion. The follow-up questionnaires were sent to the home addresses of the women 4, 8, 12, 18, and 24 months after the inclusion.

The following types of data were used in the analyses: data from the first four questionnaires, data from the National Quality Register for Breast Cancer, data from the Cause of Death Register, data extracted from medical files, and data from the SIA. The comprehensive questionnaires were developed based both on validated items and new ones constructed within a multi-professional and inter-disciplinary research group, and slightly revised after they were pilot-tested (described in detail elsewhere (176, 177)). The items used in this study were sociodemographic characteristics, self-rated health (from SF-12 (178)), and questions about having experienced three types of encounters regarding work and SA with healthcare professionals (self-constructed questions). Furthermore, data was obtained from the Swedish National Quality Register for Breast Cancer on cancer stage, type of surgery; from the Cause of Death Register (kept by the National Board of Health and Welfare) about the date of death; from medical files regarding adjuvant treatment, direct reconstruction, and relapse within 2.5 years after surgery date; data from SIA regarding start and end dates of SA spells longer than 14 days and on DP for the period of two years before and two years after the BC surgery.

Eligibility criteria for this study were: aged ≤ 63 years (the upper age limit to be sure that not having reached the age of 65 years, i.e., ordinary retirement age in Sweden at that time, before end of follow-up), living in Stockholm, Sweden, literate in Swedish, with a first BC diagnosis not in-situ (abnormal cells which have not spread beyond where they first formed), and without known metastases or neoadjuvant treatment (a first step before the main treatment in order to shrink a tumor). Given that some women may have been on SA due to an acute response related to the BC during the period of examination before the formal BC diagnosis and surgery, all with any SA the year before surgery were included. Excluded were those on DP for more than 50% of full-time working hours during the two years before the

surgery (n=37), and those with an ongoing SA spell that had lasted for more than two years at inclusion and was for more than 50% of full-time (n=4). Those who during the follow-up reached the age of 65 years (n=13) or died (n=6), were also excluded. This resulted in 690 women included in the study sample.

Dropout analyses were conducted for all background characteristics. How the items have been categorized or dichotomized in the study is described in detail in Study II (179).

4.1.3 Study III

In this study, in contrast to study II, where only women with BC were included, the interest was to find out if the women with BC differed from other women on SA in terms of experiences of encounters regarding work and SA from healthcare professionals. Another interest was to gain more knowledge concerning experiences of encounters regarding work among women on long-term SA, and if such encounters influence their RTW.

The study design was a cross-sectional nationwide survey. The participants were identified by the SIA, and a questionnaire was sent to the home addresses of a random sample of about half of all sickness absentees in Sweden in April 2013 (n=17 395) with an ongoing SA spell having lasted for at least four but not longer than eight months. Invited were those aged 19-65 years (i.e., “ordinary” working age in Sweden). Of those invited, 64.9% (n=11 288) were women and their response rate was 55.4% (n=6254), a slightly higher response rate among those on SA due to cancer diagnosis.

The questionnaire data was linked with data from Statistics Sweden (regarding sociodemographic factors, e.g., age, country of birth, educational level) and from SIA (regarding SA diagnoses, i.e., the first stated SA diagnosis in the certificate, information on self-reported SA diagnoses was retrieved from the questionnaire) by using the unique personal identity number assigned to all people living in Sweden. The research group received anonymized data from Statistics Sweden, which both administrated the survey and conducted non-responder analysis.

The comprehensive questionnaire included several items concerning encounters with healthcare professionals as well as with SIA. It was a slightly revised version of a previous questionnaire that was based on individual- and group-interviews of long-term sickness absentees, and literature reviews (6, 48, 51, 180). After excluding those with missing data on the general questions about encounters with healthcare professionals (n=15), 6197 women remained for the analysis. The distribution of their SA diagnoses is presented in Figure 4.

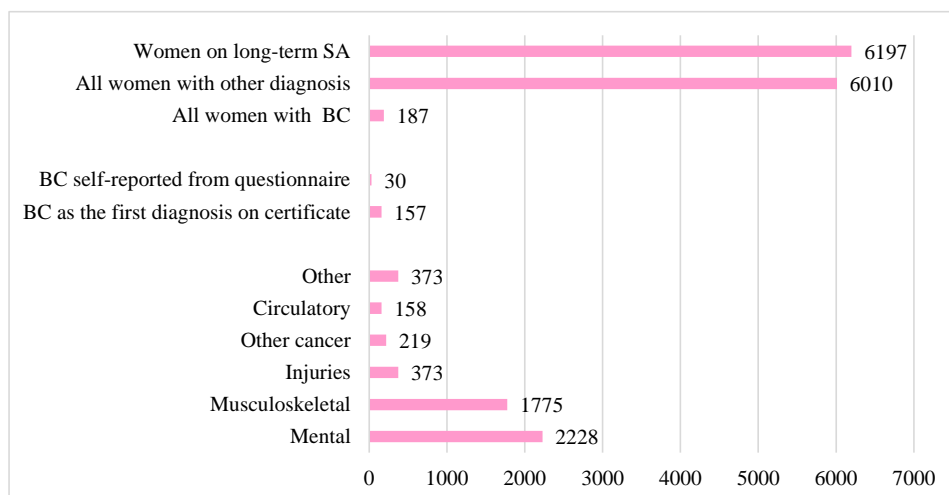


Figure 4. Distribution of sickness absence (SA) diagnoses, the first diagnosis stated on the certificate or self-reported from questionnaire, among women on long-term SA; for all women, women with breast cancer (BC), women with other SA diagnoses than BC.

In this study, the answers to questions regarding encounters with healthcare professionals were analyzed. The included items and how the items have been categorized and/or dichotomized in the study, are described in detail in Study III (181).

4.1.4 Study IV

Although patients with cancer or other SA diagnoses have encounters with several healthcare professionals during their SA, the physicians play a central role in the SA process since they are the ones who write the medical certificates for SA. Therefore, in this study the focus was on possible effects of interventions regarding physicians' sickness certification practice, in terms of SA and RTW among their patients. To investigate this, a systematic literature review with meta-analyses was conducted. A detailed study description is found in a review protocol registered in PROSPERO (182).

The search included publications reporting effects of controlled interventions regarding physicians' sickness certification practice published through February 2019. The search was conducted in PubMed and Web of Science, and by electronic tracking of citations, references, and author names as well as including studies from two previous reviews (1, 40). Further, through communication with other researchers active within this research area regarding potentially relevant studies. Inclusion criteria were peer reviewed publications in English, and meeting the criteria formulated according to the PICO (Population, Intervention, Comparator, Outcome) framework (183);

- Population: sickness certifying physicians
- Intervention: interventions (including so called natural experiments and based on, e.g., change in regulations, implementation of national guidelines etc.)
- Comparator: another intervention / a non-exposed group
- Outcomes: effect on physician's sickness certification practice measured as RTW, SA or other comparable term among their patients or on certificates

Keywords used were Mesh terms: physicians, practice patterns, education, guidelines, guideline adherence, assessment, intervention, sick leave, sickness certification, medical certification, sick listing, disability evaluation, disability insurance, return to work, work ability, work capacity evaluation, work inability, work incapacity, work capacity, medical certificate, insurance medicine. The complete search string can be found in Study IV.

The evaluation of relevance of the publications was facilitated by the free Systematic Reviews web application "Rayyan QCRI" (184). The screening was conducted independently and blinded by two researchers. Any discrepancies were resolved by consulting a third researcher in order to reach an agreement.

Of the 1399 identified publications, 12 relevant publications were included, covering nine different interventions. Among the intervention studies screened, an additional comparable outcome measure, not included in the manuscript for Study IV was found. In four studies the outcome measure was knowledge, measured with a knowledge-test.

4.1.5 Exposure, covariates, and outcome measures

In Study I, the exposures were self-assessed organizational prerequisites for sickness certification consultations, and experiences of different sickness certification aspects. The outcomes were experiencing such consultations as problematic, and not having enough resources for sickness certification tasks. The organizational prerequisites were about having time for skills development, access to guidelines and time for sickness certification tasks, and to have support from the manager for these tasks. The aspects of sickness certification were about the experience of not having sufficient competence in insurance medicine, assessing work ability, handling the consultations with the patient, and being both the treating physician and the medical expert towards other authorities. Some of the response alternatives were about frequency of experiences (times/week, about once a month, about once a year, never or almost never), others were about severity of problematic experiences (very, somewhat, not so much, not at all) or agreement related to different statements (totally agree, agree to large extent, hardly agree, do not agree at all). These were categorized or dichotomized for analyses.

In Study II, the exposures were self-reported experiences of encounters regarding work. The outcome was net days of SA during year two after the BC surgery. The SA spells included

were longer than 14 days. Net days were calculated so that, e.g., two half-days' equaled one whole day and were then summed to total net days per year. The minimum length of the spell was set due to the fact that in Sweden, sick pay is for most employees covered during the first 14 days by the employer, and from day 15 of SA by SIA. In Study III, the duration of SA (4-8 months) from SIA was used as inclusion criteria. The time limit of four months was set in accordance with the notion that the vast majority of the sickness absentees should have had a chance to have an encounter also with a SIA officer, i.e., according to rules of the public social insurance system, all sickness absentees should have had such contact within three months. The eight-month limit was set to be able to compare the results with previous studies based on a nationwide survey, and to increase the possibility to compare results with results from other countries, as in most countries it is not possible to be on SA for more than a year. The exposure in Study III was self-assessed experience of encounters, and the outcome was positive encounters influence on ability to RTW.

Sociodemographic factors, such as, educational level, birth country, and age are well known to be associated with SA and DP (185-189) and were, therefore, used as covariates in both Study II and III. In Study II other known risk factors such as self-rated health, TNM classification, type of surgery, and type of treatment were used as covariates. Since there is a covariance between staging, surgery and treatment, TNM base for surgery was not included in the analysis. In study III, depressive symptoms were used as a covariate, since previous research has reported that depressive symptoms are common among sickness absentees, and especially among long-term sickness absentees. Depressive symptoms might also influence both the experience of encounters, how one responds in a survey and how the patient is actually encountered by the healthcare professionals.

In study IV, the exposure was the interventions directed to change physicians' sickness certification practice, and outcomes were patients' SA, RTW, absenteeism, days off from work, and/or work resumption measured after the intervention. The outcome used in the meta-analyses was any RTW (first-, partial-, or full) and full RTW, measured as relative estimates.

4.2 STATISTICAL ANALYSES

In study I-III, proportions were calculated for all variables. Thereafter, the variables in the data sets were categorized in several groups or dichotomized, and logistic regressions with odds ratios (OR) and 95% confidence intervals (CI) were conducted. The use of logistic regression made it possible to estimate how much more likely or unlikely it is, that the result will be 1 compared to 0, i.e., if there were associations between the exposures and outcome measures. To give a more meaningful interpretation of the results, the ORs were calculated. Further, the models were built to examine the probability of the binary or categorical outcomes with a set of covariates.

Study IV was conducted as a systematic review with a meta-analysis. This was found to be a useful method since the intention was to analyze multiple studies and to summarize results

across studies. The meta-analysis was conducted in order to be able to pool results, and to quantify the intervention effects by estimating the relative risks for the exposure effect on the outcome (190).

4.2.1 Study I

Frequency and percent of the characteristics of the study sample, including reported experiences of sickness certification consultations and organizational prerequisites for such consultations, were calculated. Analysis were conducted, using logistic regression and ORs with 95% CIs, for associations between background factors and organizational prerequisites for sickness certification and experiencing sickness certification consultations as problematic. This was done first, and it was found that lack of resources was related to experiencing sickness certification as problematic in general. Therefore, the next step was to investigate if also specific situations regarding sickness certification were related to the lack of resources. Logistic regression with ORs with 95% CIs were then also used to calculate associations between an overall question about having enough resources for sickness certification tasks, one organizational prerequisite, and experiences of different sickness certification aspects. Only crude ORs are presented due to the fact that none of the ORs calculated for background variables were significantly associated in the univariate analysis.

A sensitivity analysis was conducted by re-categorization of the age-groups and years at workplace, and then recalculated for the entire sample.

4.2.2 Study II

Frequency and percent of the characteristics of the study sample, encounters regarding work with healthcare professionals, and SA and DP days both separately and summed together were calculated. Both crude and adjusted analyses (age, birth country, educational level, self-rated health, treatment) using logistic regression with ORs with 95% CI were conducted for associations between having experienced encounters regarding work during the first year and having any SA during the second year. Since very few women (5.1%) had DP during the second year, analyses of associations were only conducted with SA as an outcome. Further, in analyses of associations, the women who died (n=6) or had a relapse (n=38) during follow-up were excluded, as were women with any DP (n=32). The reason behind excluding women with DP already at the surgery, was the notion that ongoing DP might affect the encounters regarding work the women had experienced, and the fact that they were not at risk for SA when on full time DP.

A sensitivity analysis was conducted, stratified by those receiving chemotherapy, to see if this was associated with SA the second year after the surgery. A stratification by year of inclusion was performed due to the change in SA rules in Sweden 1 July 2008, to see if the stricter rules for SA were associated with SA the second year.

4.2.3 Study III

Frequencies and proportions were calculated for the characteristics of the study population, and both general and specific types of encounters with healthcare professional. Statistical differences between groups were determined by using Chi2-tests. Most of the women had experienced different types of positive encounters and stated that encounters were overall positive, while very few women, less than one fifth among women with BC had experienced negative encounters with healthcare professionals. Therefore, experiences of negative encounters were not included in further analysis.

Both crude and adjusted analyses (adjusted for age, country of birth, educational level, and depressive symptoms) using logistic regression with ORs and 95% CI were conducted for background characteristics and the statement that positive encounters had influenced their ability to RTW. Analyses were conducted comparing the group of women on SA due to BC and the group of women on SA due to other SA diagnoses, both within and between respective group. Further, analyses within the group of women on SA due to BC and the group of women on SA due to other SA diagnoses, were also performed for experiences of specific types of positive encounters and if positive encounters had influenced their ability to RTW. Those stating having experienced specific types of positive encounters were compared with those who had not experienced such encounters.

A sensitivity analysis was conducted by excluding the women with SA due to other cancer diagnoses from the comparison group.

4.2.4 Study IV

In Study IV, the full text publications were read through, and all identified publications were assessed for relevance according to the inclusion criteria. The evaluation of relevance of each publication, was performed by using the free Systematic Reviews web application “Rayyan QCRI” [32]. The screening was conducted independently by the author and another researcher for search hits at a title and abstract level. Then full-text screening of publications presenting relevant outcomes were conducted. A third researcher was consulted to reach an agreement when disagreements arose.

Study characteristics extracted were: first author, publication year, country, aim, study design, setting, year of inclusion, duration of follow-up, inclusion/exclusion criteria presented, population of physicians, participation rates, type of intervention, intervention components, type of data, method for analysis, outcome measures, results, direction of intervention effect, estimates of effect sizes or data for outcome measures. Information regarding the additional outcome, knowledge, construct for and effect sizes from knowledge tests used, were extracted.

For the meta-analyses, a summarized relative risk estimate with 95% CI was chosen. The results were summarized with forest plots. For each study, relative risk (RR), hazard ratio (HR), or OR and 95% CIs were used. For studies not reporting risk estimates, RRs were

calculated from number of patients with the outcomes in the intervention group (IG) and the control group (CG). The meta-analyses were performed with data pooled using random effects models. Statistical heterogeneity between study-specific estimates was indicated with Cochran's Q-test and the I^2 statistic (a higher value indicated a greater degree of heterogeneity), and for "knowledge" also by chi-squared test (χ^2) presenting degrees of freedom (df) and probability with p-value (p). Analyses were conducted for the variables SA or RTW or comparable terms; absenteeism, work resumption, categorized as any RTW (first-, partial-, or full RTW) or full RTW. The effect of the outcome was defined as effect in intended direction since the aim of the intervention studies was to either reduce SA or have an impact on earlier RTW. Further, analyses stratifying on type of intervention, design, type of physicians targeted, and geographical area were performed. Further a sensitivity analysis by excluding one study at a time and then pooling the estimates for the rest of the studies, was performed. Meta-analysis was also conducted for the additional outcome, knowledge, measured as: overall knowledge regarding communication during work capacity assessment interviews (191), knowledge regarding quality of assessment interviews (192), knowledge regarding guidelines (167), and knowledge about functional assessments (193). The analyses were conducted with STATA 12.

5 RESULTS

This section summarizes the main findings from study I-IV. More information and detailed results for each of the studies are presented below.

5.1 STUDY I

In study I, the focus was on how oncologists experienced sickness certification consultations. It was found that a majority (92.2%) of the oncologists having sickness certification consultations, had such consultations weekly, and that 17.8% experienced the consultations as problematic at least once a week. About one third of the oncologists stated that the national guidelines for sickness certification facilitated their contacts with the patients (34.5%). About one third had joint routines/policies for sickness certification at the clinic (29.7%), and a majority of those having routines/policies at the clinic, found them useful (88.6%). A majority would value a joint tool/protocol for assessment of work capacity (81.4%).

Proportions for those experiencing aspects of consultations as problematic are presented in Figure 5. Regarding the question “How problematic do you find it in general to handle sickness certification of patients”, it was observed that 21% of the oncologists found it very or fairly problematic, 16% found it very or fairly problematic to, together with the patient, consider the pros and cons of being on SA, and 33% very or fairly problematic to handle that they had different opinions about the need for SA than the patient. To manage the two roles as the patients’ treating physician and as a medical expert was found as very or fairly problematic by 37%. Further, 45% of the oncologists experienced it as very or fairly problematic to assess to what extent the patient’s reduced functioning limited their work capacity (45%); a higher proportion (57%) regarding the work capacity of unemployed patients.

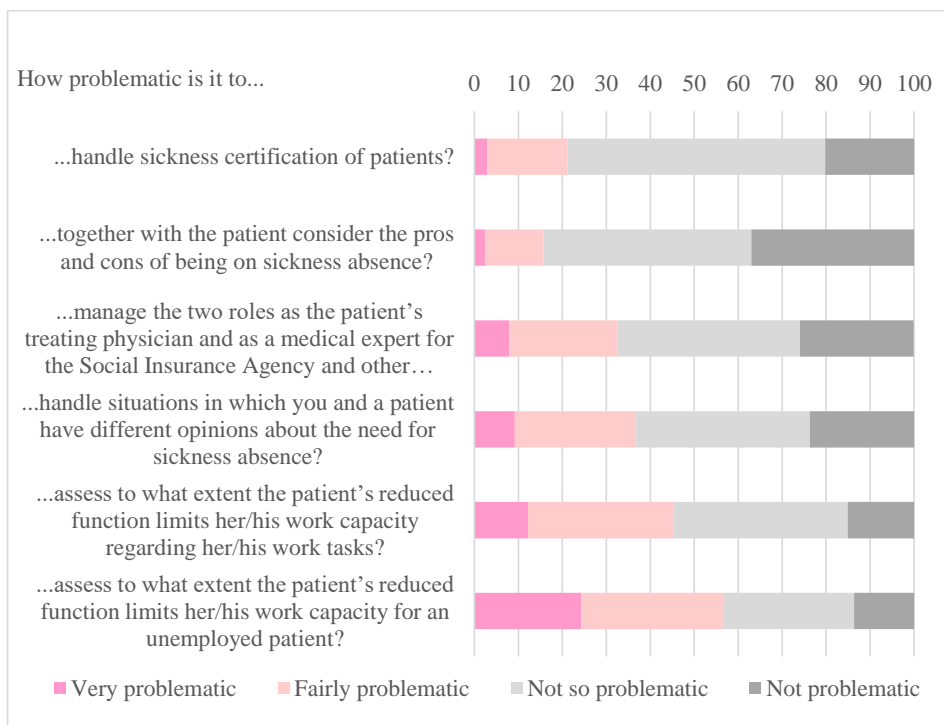


Figure 5. Proportions (%) of oncologists (n=342) giving different answers to questions regarding how problematic they found different task related to sickness certification of patients.

In analyses of associations, it was found that there was an association between oncologists stating not having enough resources for work with sickness certification tasks and experiencing consultations as problematic (OR 3.5; 95% CI 1.9-6.3). Thereafter, associations between oncologists' experiences of specific aspects of sickness certification and not having enough resources for the work with sickness certification were investigated. Here it was found that there were associations between oncologists stating that their competence in insurance medicine was not sufficient at least monthly and that they didn't have enough resources for the work with sickness certification (OR 3.3; 95% CI 1.9-5.8). Higher ORs were also found between not having enough resources and the oncologists experiencing it as problematic in general to handle sickness certification (OR 4.3; 95% CI 2.4-7.6), or together with the patient consider the pros and cons of being on SA (OR 2.3; 95% CI 1.2-4.1), or to manage the two roles as the patient's treating physician and as a medical expert for the SIA and other authorities (OR 3.3; 95% CI 2.0-5.3). Further, higher ORs were found between not having enough resources and that the oncologists were experiencing it as problematic to handle a patient with different opinion about the need for SA (OR 2.4; 95% CI 1.5-3.7), or to assess the patient's work capacity (OR 2.3; 95% CI 1.5-3.7), or to assess the unemployed patient's work capacity (OR 2.6; 95% CI 1.6-4.0).

In further analyses, three items subordinated the overall question regarding the statement not having enough resources for sickness certification tasks regarding time related aspects of resources were included, namely lack of time: with patients, for patient related activities, and for competence developmental activities. Here it was found that there were associations between oncologists' experience of specific sickness certification aspects and having lack of time when handling sickness certification tasks (Table 3).

Table 3. Odds ratios (OR) with 95% confidence intervals (CI) for the associations between oncologists (n=342) experiencing lack of time for three specific sickness certification tasks and their experiences of various sickness certification tasks at least monthly. Those with the specific experiences were compared with those who had no such experiences.

Sickness certification tasks	Lack of time for sickness certification tasks at least weekly		
	With patients OR (95% CI)	Patient-related aspects ¹ OR (95% CI)	Competence development, supervision or reflection OR (95% CI)
At least once a month vs less than once a month...			
... experience that your competence in insurance medicine is not sufficient?	2.91 (1.57-5.40)	2.79 (1.40-5.57)	2.11 (1.21-3.70)
... experience conflicts with patient about sickness certification ²	2.12 (0.96-4.66)	1.97 (0.83-4.65)	2.84 (1.32-6.11)
... certify unnecessarily long SA periods due to waiting time to next available appointment ³	2.55 (1.22-5.34)	1.64 (0.78-3.46)	1.66 (0.87-3.18)
... certify unnecessarily long SA periods due to that it takes too long to explain the alternatives to being on SA or motivate return to work	3.11 (1.03-9.42)	2.93 (0.84-10.13)	2.19 (0.87-5.51)
Problematic vs not problematic⁴...			
... in general, to handle sickness certification	2.62 (1.43-4.82)	2.10 (1.09-4.06)	1.65 (0.94-2.88)
... to together with the patient consider the advantages and disadvantages of being on SA	1.54 (0.82-2.91)	1.08 (0.56-2.07)	1.4 (0.76-2.58)
... to manage the two roles as the patient's treating physician and as a medical expert for the Social Insurance Agency and other authorities	2.61 (1.57-4.34)	2.12 (1.23-3.65)	1.40 (0.76-2.58)
... to handle situations in which you and a patient have different opinions about the need for SA	1.94 (1.21-3.12)	1.52 (0.92-2.52)	2.02 (0.125-3.26)
... to assess to what extent the patient's reduced function limits her/his work capacity regarding her/his work tasks?	1.82 (1.16-2.85)	1.20 (0.75-1.93)	1.65 (1.06-2.57)
... to assess to what extent the patient's reduced function limits her/his work capacity for an unemployed patient?	2.02 (1.29-3.15)	1.32 (0.82-2.12)	1.68 (1.08-2.62)

NOTE SA=sickness absence, ¹e.g., issue certificates, contact stakeholders, documentation, and meetings, ²> 10 times a week/6-10 times a week/1-5 times a week/about once a month vs About once a year/never or almost never, ³Every day/about once a week/about once a month vs About once a year/never or almost never, ⁴ very/somewhat problematic vs Not so much/not at all.

5.2 STUDY II

In the second study, the perspective was shifted from oncologists to women of working age having had a first BC surgery. The study concerns women's experiences of encounters regarding SA and work, and the possible association of this with SA in the second year after the inclusion.

Most of the women had no SA in the second year after surgery, while, 36% had some SA. About 80% of the women had experienced encounters regarding SA or work at least once during the first year; at baseline, and at 4 and/or 8 months after surgery (Figure 6).

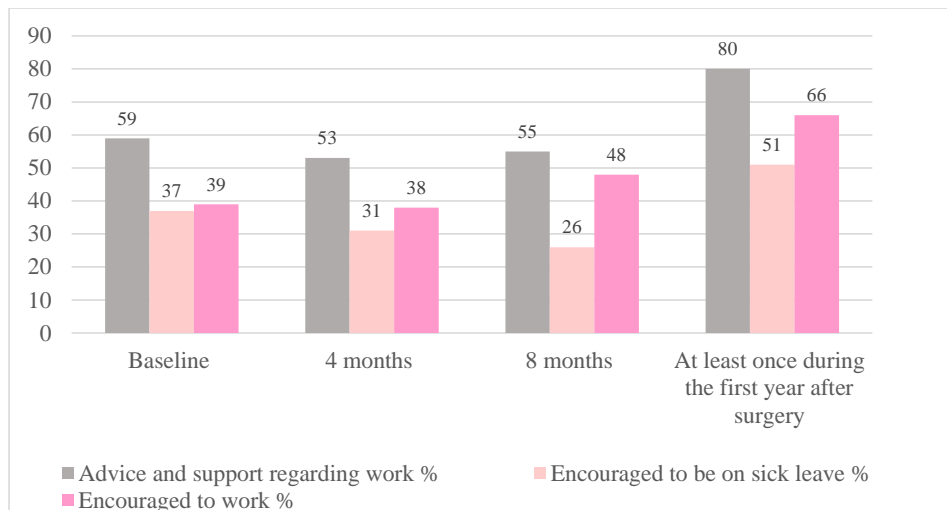


Figure 6. Proportion (%) of women (n=690) having experienced three types of encounters at least once during the first year after the breast cancer surgery; at baseline (4 weeks), 4 months, and/or 8 months, respectively.

There was a high agreement between type of experiences of specific encounters and the outcome, SA during the second year after the inclusion, among women with BC. Associations were found between having experienced “advise and support regarding work” (OR 0.5; 95% CI 0.3-0.9) or had been “encouraged to work” (OR 0.5; 95% CI 0.3-0.9), and having less SA days year two after surgery. There was also an association between experiencing “encouraged to be on SA” (OR 1.2; 95% CI 0.8-1.9), and having more SA days, but this was largely explained by disease- and treatment-related factors (Table 4).

Table 4. Frequencies, percentages, crude and adjusted odds ratios (OR) with 95% confidence intervals (CI), of having experienced three types of encounter regarding work at least once during 8 first months after the BC surgery and days of sickness absence (SA) during year 2 after the BC surgery. Those with relapse within 2.5 years or any DP year 2 after BC surgery where excluded, (n=621).

	Always/often vs Seldom/never n (%)	Crude OR (95% CI)	Adjusted OR (95% CI) ¹
Advice and support regarding work			
SA 0	335 (82.7) / 70 (17.3)	Ref.	Ref.
SA >0≤90	111 (81.0) / 26 (19.0)	0.9 (0.5-1.5)	0.8 (0.5-1.4)
SA 91-365	57 (72.2) / 22 (27.8)	0.6 (0.3-1.0)	0.5 (0.3-0.9)
Encouraged to be on SA			
SA 0	192 (47.4) / 213 (52.6)	Ref.	Ref.
SA >0≤90	81 (59.1) / 56 (40.9)	1.6 (1.1-2.4)	1.1 (0.7-1.8)
SA 91-365	42 (53.2) / 37 (46.8)	1.3 (0.8-2.0)	0.7 (0.4-1.1)
Encouraged to work			
SA 0	282 (69.6) / 123 (30.4)	Ref.	Ref.
SA >0≤90	95 (69.3) / 42(30.7)	1.0 (0.6-1.5)	1.1 (0.7-1.8)
SA 91-365	40 (50.6) / 39 (49.4)	0.4 (0.3-0.7)	0.6 (0.3-0.9)

NOTE Adjusted for age group, country of birth, educational level, type of breast surgery, type of axillar surgery, chemotherapy. Partly also presented in Study II, Table 5.

In a sensitivity analysis when stratifying for chemotherapy, no differences were found concerning the associations between experiences of encounters and SA during the second year after the surgery. When stratifying on the time of the change in the Swedish SA regulations from the 1st of July 2008, there were no significant changes in the associations between those included before and those included after the change of regulations.

5.3 STUDY III

In the third study, the focus was also on women with BC, and here they were compared with women on SA due to other SA diagnoses.

It was observed that about 95% of the women on SA, both those due to BC and those with other SA diagnoses, had experienced positive encounters with healthcare professionals in connection to their SA. About 20% of the women in both groups had experienced negative encounters. When comparing the women with BC and the women with other SA diagnoses, no statistically significant difference was found between the groups regarding their experiences of having any positive encounter (OR 1.1; 95% CI 0.5-2.2) or any negative encounter (0.8; 95% CI 0.6-1.2) (Table 5). In the sensitivity analysis when comparing the women with BC and the women with all other SA diagnosis except cancer, the estimates for the experience of any positive or any negative encounter did not change (Table 5).

Table 5. Odds ratios (OR) with 95% confidence intervals (CI) comparing any positive and negative encounter experienced among women with BC, and women with other SA diagnoses and women with other SA diagnoses except for cancer, respectively.

	Women on SA due to all other diagnoses Adj OR ^a (95% CI)	Women on SA due to other diagnoses except cancer Adj OR ^a (95% CI)
Any positive encounter	1.1 (0.5-2.2)	1.1 (0.5-2.2)
Any negative encounter	0.8 (0.6-1.2)	0.8 (0.6-1.2)

NOTE ^aAdjusted for age (19-44, 45-54, 55-65), country of birth (Sweden, elsewhere), educational level (primary/secondary school, college/university), and depressive symptoms (yes, no). Partly also presented in Study II, Table 2.

Statistically significant differences were observed for 4, of total 19, statements about having experienced specific types of positive encounters. The encounters experienced by a smaller proportion of the women with BC compared with the women with other diagnoses were: “allowed me to take own responsibility” (OR 0.6; 95% CI 0.4-0.8), “encouraged me to carry through my own solutions” (OR 0.5; 95% CI 0.4-0.7), “made reasonably high demands” (OR 0.6; 95% CI 0.4-0.9), and “sided with me/stood on my side” (OR 0.6; 95% CI 0.4-0.8) (Table 6).

Table 6. The number and percentages of women on long-term sickness absence (SA) due to breast cancer (BC) (n=187) and other SA diagnoses (n=6010), and odds ratios (OR) with 95% confidence intervals (CI) comparing the different types of encounters experienced by women with BC and women with other SA diagnoses.

	Women on SA due to BC n (%)	Women on SA due to other diagnoses n (%)	BC compared with other SA diagnoses Adjusted OR ^a (95% CI)
Allowed me to take own responsibility	144 (77.0)	5149 (85.7)	0.6 (0.4-0.8)
Encouraged me to carry through my own solutions	130 (69.5)	4918 (81.8)	0.5 (0.4-0.7)
Made reasonably high demands	149 (79.7)	5197 (86.5)	0.6 (0.4-0.9)
Sided with me/stood on my side	138 (73.8)	4999 (83.2)	0.6 (0.4-0.8)

NOTE ^a Adjusted for age (19-44, 45-54, 55-65), country of birth (Sweden, elsewhere), educational level (primary/secondary school, college/university), and depressive symptoms (yes, no). Partly also presented in Study II, Table 2.

A statistically significant smaller proportion of the women on SA with BC stated that positive encounters promoted their RTW compared with the women on SA due to other diagnoses (46% vs. 56%, p<0.001) (data not shown). In the analysis of associations, it was found that experiences of several specific types of positive encounters was associated with

having experienced that positive encounters had promoted ability to RTW among women with BC (range OR 2.0-5.6) (data not shown).

During their SA, the women had contact with several types of healthcare professionals, and the majority of both the women on SA due to BC and the women with other SA diagnoses had had contacts with physicians and registered nurses (Table 7). The women also stated that the contacts they had had with healthcare professionals were mostly positive.

Table 7. Frequencies, percent, and p-values among women with long-term sickness absence who had had contact with different types of healthcare professionals, and who experienced mostly positive encounters.

	SA due to BC (n=187)		SA due to other diagnoses(n=6010)		p
	n (%)	n (%)	n (%)	n (%)	
	Contact	Mostly positive encounter	Contact	Mostly positive encounters	
Physician	181 (97.0)	172 (95.0)	5841 (97.2)	5331 (91.3)	0.08
Registered nurse	178 (95.2)	175 (98.3)	4711 (78.4)	4474 (95.0)	0.04
Physiotherapist	113 (60.4)	109 (96.5)	3754 (62.4)	3548 (94.5)	0.37
Clinical social worker/ Psychologist	88 (47.1)	82 (93.2)	3244 (54.0)	2981 (92.0)	0.66
Occupational therapist	29 (15.5)	28 (96.6)	1830 (30.4)	1749 (95.6)	0.80
Naprapat/chiropractor	15 (8.0)	14 (93.3)	1204 (20.0)	1163 (96.6)	0.49

NOTE Abbreviation: SA, sickness absence. BC, breast cancer. P, p-value.

5.4 STUDY IV

In the fourth study, the focus was shifted to interventions regarding physicians' sickness certification practice, and measured as the effects on their patients' SA and RTW. In this systematic literature review, 1399 unique publications were identified, and after excluding 1326 at screening of title and abstract, 73 full-text publications remained to be assessed for relevance. Of these, 12 publications from 9 unique intervention studies (33, 193-203), were included.

The contents and effects of interventions aiming to influence physicians' sickness certification practice, were identified. The interventions included a wide range of content and outcome measures. They were conducted in three European countries, the absolute majority (seven out of nine) in the Netherlands. The study designs were; 7 RCTs and 2 CTs. All interventions included some form of training, several interventions also included an introduction of guidelines or IT-support. The analyses in the included interventions were based on several types of data sources and in total 30 different outcome measures were used regarding SA and RTW, involving aspects of duration of SA, time to RTW, or estimates for presence of SA or RTW. The effect measures for risk estimates used in the included studies were grouped by extent of RTW and are listed in Table 8.

In three of the interventions studies, a significant intervention effect in intended direction was found for shorter time to RTW; Volker et al. for first RTW (202), Rebergen et al. and Österås

et al. for partial RTW (193, 200, 201, 203), and Rebergen et al. for full RTW (200, 201), and in Österås et al. for a decrease of “active SA” (defined as enabling people on SA to attend work doing other tasks than they normally do) (193, 203) (Table 8). Among the interventions, also, unfavorable effects, i.e. prolonged time to RTW were observed in two studies, Noordik et al. (199) and Faber et al. (33). In three interventions, no statistically significant effect on the outcome measures included was found (194-196, 198).

Table 8. Risk estimates of effects of interventions regarding physicians’ sickness certification practice measured as sickness absence (SA) or return to work (RTW).

Study	Risk estimate with 95% CI
First RTW	
vanBeurden, 2017	HR 0.96 (0.80-1.15)
Volker, 2015	HR 1.45 (1.05-2.00)
Partial RTW	
Rebergen, 2010	HR 1.10 (1.00-1.20)
Österås, 2010	OR 1.33 (1.06-1.68)
Noordik, 2013	HR 0.89 (0.62-1.29)
Full RTW	
Bakker, 2007	HR 1.06 (0.87-1.29)
vanBeurden, 2017	HR 0.96 (0.81-1.15)
vanderFeltz, 2010	RR 1.01 (0.79-1.28)
Mortelmans, 2006	RR 1.03 (0.93-1.13)
Noordik, 2013	HR 0.55 (0.33-0.89)
Rebergen, 2010	HR 1.10 (1.00-1.20)
Volker, 2015	HR 1.37 (0.95-1.97)
Österås, 2010	OR 0.89 (0.79-1.01)
Active SA	
Österås, 2010	OR 1.54 (1.02-2.33)
Gradual RTW	
Mortelmans, 2006	RR 1.24 (0.52-2.97)

NOTE HR, hazard ratio. OR, risk ratio. RR, relative risk

Eight of the nine interventions included in this systematic review, were included in the meta-analysis of SA or RTW, and one intervention did not have enough information to calculate a risk estimate (33). The aim of the interventions was to either reduce SA or shorten the time to RTW. The effects were summarized, and a significant albeit small effect of the intervention, in intended direction, was observed for having any RTW (first, partial, or full) (pooled RR 1.09; 95% CI 1.00-1.19), but not for full RTW (pooled RR 0.98; 95% CI 0.89-1.08). In further meta-analyses for having any RTW, and stratified by design, type of intervention, geographical area, and type of physicians targeted, an intervention effect in intended direction was observed for simple intervention studies i.e. interventions that only targeted physicians

(pooled RR 1.08; 95% CI 1.00-1.17) and for studies not conducted in the Netherlands (all were European) (pooled RR 1.32; 95% CI 1.06-1.65). In sensitivity analysis, when excluding one study at a time and then pooling the estimates for the rest of the studies, the effect for having any RTW remained significant and positive in three of eight analyses (pooled RR range 1.07-1.12).

Another comparable outcome was identified from the intervention studies. In four of the studies the effect of the intervention was measured with a knowledge test regarding sickness certification tasks. In the study by Spanjer et al. (191) and van Rijssen et al. (192), a 10-point scale knowledge tests were used (1 ‘totally disagree’ to 10 ‘totally agree’), Zwerver et al. used a 7-point scale to be scored true or false (167), and Österås et al used a 5-point scale (1 “totally disagree” to 5 “totally agree”) (193). In the meta-analysis, no heterogeneity among the four included studies was observed, and a summarized significant effect, increase of knowledge, was found (pooled standardized mean difference 1.20, 95% CI 0.90 - 1.49) (Figure 7).

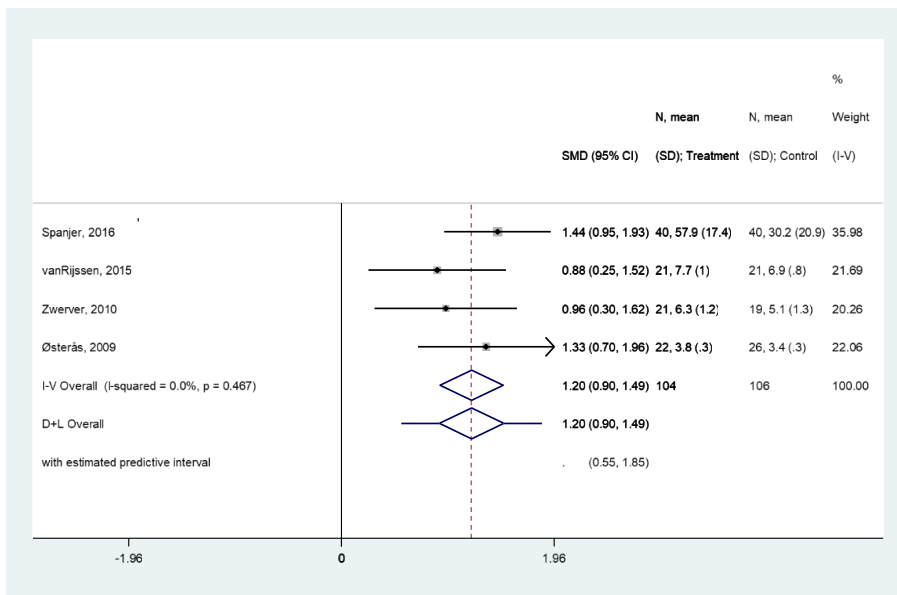


Figure 7. Meta-analysis with a forest plot of outcome measures regarding knowledge on sickness certification tasks, following interventions regarding physicians’ sickness certification practice. NOTE N, the population size. SMD, standardized mean difference. SD, standard difference.

6 DISCUSSION

In this thesis, the focus was on healthcare professionals' work with SA, and the influence of this on SA and RTW among patients. In Figure 8, the relations between the included study subjects in the thesis are visualized.

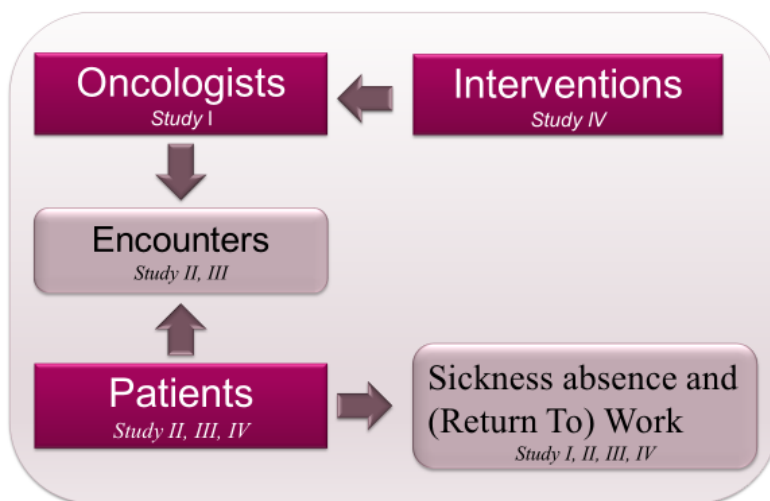


Figure 8. The relations between the included study themes in the thesis.

In Study I, oncologists' experiences of sickness certification consultations and their prerequisites, both individual and organizational, for such tasks were investigated. During the encounter between the patient and the physician, issues such as diagnosis, treatment etc. are raised. There might not be a linear relationship in one direction between the components of encounters, i.e., healthcare professional, organizational prerequisites and patients, instead the relationship might be more of a reciprocal influence between these components. Women's experiences of such encounters, after BC surgery, SA or RTW, with both the oncologists and other healthcare professionals were investigated in studies II and III, from the women's perspective. The women's experiences of encounters regarding SA and RTW as well as experiences of overall positive encounters were associated with future SA in Study II and with ability to RTW in Study III, respectively. Interventions targeting physicians' sickness certification practice might also have impact on these encounters with patients, and consequently also impact their patients' SA and RTW. This was investigated in Study IV.

6.1 MAIN FINDINGS

The oncologists often had sickness certification tasks, however, few of them experienced such tasks as problematic. An association was however found between not having enough organizational prerequisites and experiencing such consultations as problematic. The oncologists also expressed a need for more competence in insurance medicine.

Most women with BC had experienced encounters regarding work with healthcare professionals the year after the surgery. An association was found between the healthcare professionals' recommendations regarding being on SA and RTW and the outcome being on SA during the second year after surgery. That is, not only medical treatments but also encounters might influence future SA among women with BC.

Positive encounters with healthcare professionals, in connection to their SA, were experienced by most of the women on long-term SA. About half of the women stated that positive encounters promoted their ability to RTW, and this was associated with experience of specific types of positive encounters such as encouragement and giving support, however, fewer women with BC had experienced such encounters.

The systematic literature review with meta-analysis of nine intervention studies targeting physicians' sickness certification practice indicated a small summarized intervention effect, i.e. shorter time to RTW, for any RTW (first, partial or full). In four of the included studies significant intervention effects in the intended direction were found for first-, full-, or partial RTW, and for decrease of active SA. In two of the included studies a prolonged time to RTW was found, and in three studies no significant effect on SA or RTW was observed.

6.2 DISCUSSION OF THE RESULTS

Some overarching themes of importance for healthcare professionals' work, in general and in the context of oncology, is visible in the results of the different studies. This section addresses these common themes, as well as the application of the conceptual framework.

6.2.1 Professionals' work with sickness absence

The organization of healthcare might differ between different oncology clinics, e.g., in terms of which professionals that are involved in the team around the patient. Oncologists have an obvious role in the SA process, but also other professionals such as physicians with other specialties, nurses, hospital social workers, physiotherapists, and occupational therapists, may have an important role. As observed in Study III, the women with BC reported having had contact with several different healthcare professionals in connection to their SA, e.g., almost all women with BC had had contacts with registered nurses, beside a physician. In Sweden, the contact nurse function is a well-implemented part of the team around women with BC, and they are involved during the whole process, from diagnosis until the patient is assessed to be fully recovered from their cancer (46).

Fewer oncologists experienced the sickness certification tasks as problematic, compared to physicians in other types of clinics. One possible theory for explaining this might be that SA due to a cancer diagnosis is not questioned by the SIA as often as, e.g., SA due to a musculoskeletal or mental diagnosis. Another explanation might be that the contact nurses, who have a formal assignment to provide information and support during the SA process, discuss also issues regarding SA and RTW with the patients. Moreover, oncology is also a specialty that often has clear guidelines for treatment, which might make it easier to give advice and make assessments of prognosis, recovery and work capacity. Not all cancer diagnoses are however covered by “the National guidelines for sickness certification”, but the national care program for cancer rehabilitation contains general guidelines for treatment including some advice concerning work and SA. The oncologists in Study I stated that they appreciated “the National guidelines for sickness certification” as well as joint routines/policies regarding handling of sickness certification tasks, if such were implemented at their clinic.

It was also observed that 17.8% of the oncologists experienced sickness certification consultations as problematic on a weekly basis. The task of assessing to what extent the patient’s reduced function limits her/his work capacity was also experienced as problematic by about half of the oncologists. It can be hypothesized that one reason for this might be the oncologists limited insight into the patient’s situation regarding specific work tasks and demands. It can also be difficult to predict the late effects of cancer treatment and how functional limitations following the treatment reduce the work capacity and the need of adjustments, both regarding SA and at the workplace. This may be difficult especially since the late effects might differ across individuals, e.g., among women with BC (85, 89-92, 99, 102, 204). To assess work capacity is however a problem reported by physicians in general and, so far there are no broadly implemented good instruments for assessments of work capacity (205), why this issue tends to be experienced as problematic by many physicians.

In Study I, the oncologists also reported lack of time with patients and for patient-related tasks regarding sickness certification issues. In Sweden recently a function with so called rehabilitation coordinators in healthcare have been implemented (206). First in primary and psychiatric healthcare (38, 207, 208), and so far only to a low extent in oncology clinics (38). These rehabilitation coordinators mainly have three tasks; 1) to identify individuals at risk for long-term SA, 2) give individualized and targeted support, and 3) conduct follow-up concerning SA (208). Besides better support concerning RTW for patients, one may acknowledge the potential for this function to also improve the physicians time constraints, by the rehabilitation coordinator taking some of the tasks otherwise performed by the physician.

Half of the oncologists in Study I reported lack of time for competence development regarding insurance medicine and one third reported experiencing lack of competence in insurance medicine. It is possible that the situation is similar for other healthcare professionals as well. Lack of time for competence developmental activities regarding

sickness certification and lack in competence in insurance medicine, could also be considered as patient safety matter. This considering that it has been shown that specialist competence is associated with improved patient safety, and consequently that lack of competence may have a negative impact by leading to decreased ability to make informed decisions regarding the patient' care (209). In the context of Study I, the oncologists experiences of the assessments of work capacity, and the assessments of the need, length and duration of SA as problematic might be seen as relating to patient safety.

Lack of time for competence developmental activities might also be a concern when implementing interventions aiming to improve physicians' competence in sickness certification tasks. This might have influenced the results in Study IV.

6.2.2 Measuring sickness absence and return to work

In Study II, SA was measured using SA days registered by the SIA for the second year after surgery. It was observed that about 36% of the women with BC had some SA during the second year after their surgery. This means that 64% of the women had no SA during the second year after the surgery, the same proportion is seen during the third year after BC diagnosis in a newly published study from Sweden (210, 211). All of the reasons for why some women with BC were able to RTW or stay at work while others did not, were not extensively explored in this thesis. It could be hypothesized that one reason for prolonged RTW could be long-term side-effects of BC-treatment or of the cancer development, and in these situations full RTW might not even be an option for some women. Of course, the women might also have other types of morbidity, leading to SA or DP (211).

In Study III, the information about ability to RTW was self-assessed and information was missing regarding whether the women had actually RTW or not.

In Study IV, different outcome measures were used in the included intervention studies; SA, RTW, absenteeism, days off from work, work resumption, and benefit dependency. A great variation was also observed regarding; duration of the follow-up times, time-periods, the sickness absentees' status regarding time off from work at baseline and at the end of follow-up, as well as sources of information. In previous research, the discussion has been raised concerning which measures should be used, given the huge amount of different measures of SA (26-29) and of RTW (212). Similarly, it can also be discussed how RTW should be reported and defined. There are, e.g., a need for an agreement on how long the period of being back at work must be in order to be considered as lasting RTW. In two of the interventions included in Study IV, lasting RTW was defined as work resumption of at least four weeks (194, 195, 197). The other included studies did not present a definition of lasting RTW. Some patients might have been able to RTW full-time but not to the same job tasks as before, a further circumstance that also complicated the comparison of interventions.

6.2.3 Encounters in relation to work and sickness absence

The ability to RTW may be influenced by several other factors besides the disease- and treatment-related factors, e.g., encounters regarding SA and work from physicians and other healthcare professionals as observed in Study II and III. The impact of encounters have also been shown both in previous studies among women with BC (147, 154) and among sickness absentees in general (8, 11, 51, 53, 58, 179, 181).

In this thesis, encounters from healthcare professionals were investigated from the perspective of women with BC in Study II and III. In addition, Study I captured the oncologists' experiences of working with SA. In Study II, it was observed that for women with BC, there was an association between the type of encounter i.e. being encouraged to be on SA, or to work, and the outcome. It was more likely that the women had less SA if they had been encouraged to work, and vice versa. It is reasonable to assume that this might reflect that the advice and support are related to diagnosis, treatment, etc. It could however to some extent also reflect women following the healthcare professionals' general suggestions regardless status of the disease. This interplay could also be understood in light of a theoretical model showing how encounters might influence sickness absence (6, 9, 48). Positive or negative encounters might lead to strong emotions influencing the different actions the sickness absentee takes. SA might not be a personal choice, but the encounter arouses emotions that in turn affect the patient's own experience of their ability to RTW as well as their ability to recover from disease and to participate in rehabilitation. In Study III, a majority of the women with BC had experienced positive encounters, which according to the model would be associated with emotions such as pride which has a positive impact in terms of strengthened work capacity and health during the recovery period. About 20% of the women in both groups had experienced negative encounters. Experiences of negative encounters have previously been shown to be associated with emotions such as shame (48). The experience of such encounters might have not only mental, but also social, as well as occupational consequences (7).

It was observed that 36% of the women had SA during the second year after BC surgery, and that disease and treatment related factors, as well as encounters regarding work were associated with SA. Work-related characteristics such as psychosocial and physical working environment, and possibilities for adjustment, might also be of importance for RTW. Previously it has been seen that workplace adjustments are associated with reduced SA and RTW both among sickness absentees in general (213), and among cancer survivors (214). However, among women with BC, knowledge is still limited and the observations are not consistent (112, 144). Thus, it would also be interesting to investigate if the prolonged RTW is due to not receiving adjustments at the workplace, to do so was however beyond the scope of this thesis.

The women included in Study III, had an ongoing, or had very recently had, a long-term SA of 4-8 months. The time frame implies that these women with BC might still be undergoing chemotherapy and be on SA, or alternatively just RTW after SA. Both situations might have

influenced their response concerning the statement about experience of positive or negative encounters either promoting or hindering RTW. Ideally the information and advice should probably be adjusted in accordance with the course of the treatment, in accordance with a previous study showing that women with BC ask for, e.g., more advice concerning working during BC (155). The reported encounters might also be influenced by depressive symptoms, which are common among long-term sickness absentees. It is conceivable that these symptoms might have influenced both the experience of encounters, the responses in the survey, and the actual encounter by the healthcare professional.

In Study III, half of the women with BC stated that the positive encounters promoted their RTW, which is in line with studies concerning sickness absentees with other SA diagnoses (10, 14, 54, 56-58, 61-63). The question is, who is in most need of advice, support and encouragement? Who needs special efforts when it comes to encounters regarding work and what should such encounters contain? Several of the specific types of encounters women in Study III had experienced, corresponds to the core concept of person-centered care or a related concept patient-centered care, as stated by Månsson et al. (12) in their study of sickness absentees' encounters with healthcare professionals (using the same survey material). There is no requirement for person-centered care to be included in the education neither for physicians undergoing specialist training in oncology nor specialist oncology nurses, or for other specialties. However, the person-centered approach is obvious in the rules for Swedish healthcare (19, 20). Person-centered care is also one of the core competencies among healthcare professionals, according to an agreement "Person-centered care - a core competence for good and safe care" by Swedish Nurse Society, the Swedish Society of Medicine and the National Dietetic Association in Sweden (215).

6.2.4 Content of interventions regarding return to work

There was considerable variation regarding content in the included intervention studies in Study IV. Two of the interventions were complex interventions in terms of being directed to both physicians and patients. The other seven interventions were simple in terms of being directed to only physicians, which means that they were not less comprehensive. In contrast, several of the "simple" interventions were interventions implementing changes in regulations or introduction of nationwide guidelines, and/or concerning collaboration between different stakeholders. The stratified analyses showed significant effect for less time to RTW among the patients after simple interventions directed to physicians. In four of the intervention studies in Study IV, a significant intervention effect in the intended direction was observed i.e. less days of SA among patients or decreased number of SA spells. In Study IV, most of the interventions included some form of guideline introduction among the participating physicians, but it was not investigated further which components of the interventions that were most effective. In the context of this thesis it is worth noting that none of the identified interventions in Study IV focused on oncologists, thus, no comparisons can be made with the conditions reported by the oncologists in Study I.

All intervention studies included in Study IV involved elements of training. Previously it has been observed that interventions including education are promising as well as complex interventions targeting several stakeholders or including several components (216). However, it has also been widely acknowledged that no design of an intervention works in all contexts but a certain one can work in a specific context. In Study IV, the clear majority of the studies were conducted in the Netherlands, thus designed in accordance to the conditions in that country. This means that they would probably need to be adapted in order to be implemented in another country. As SA and RTW are complex phenomena, it is appropriate to measure the intervention effect also using other outcome measures. In the literature review in Study IV, an additional outcome, used by several studies, defined as a change of knowledge after an educational intervention among the targeted physicians, was identified. The meta-analysis produced a summarized effect of the interventions on physicians' knowledge with a knowledge test, i.e., physicians' knowledge regarding sickness certification was increased after the intervention.

6.2.5 Application of the conceptual framework

In this thesis, the conceptual framework used, was inspired by the overarching model “The arena of work disability” (17) (Figure 9). The focus in this thesis was on the *healthcare organization* providing healthcare service and especially two factors, the *physicians/oncologists* and *other healthcare professionals*. The *individual factors* including the *sociodemographic* and *disease- and treatment-related factors* were also in focus. The model for the framework illustrates how these factors relate to each other by targeting a woman on SA depicted in the middle of the model.



Figure 9. A model for the aspects in focus in this thesis, modified from aspects in “The arena of work disability” (17).

The *sociodemographic*, and *disease- and treatment-related factors*, may have an influence on women's chances of maintaining their work or their RTW process. For example, women with BC who had received chemotherapy might have prolonged time to RTW due to side-effects. Age and education are other factors that in previous research have been associated with SA and RTW. Therefore, the analyses in Study II of experiences of encounters regarding work were adjusted for both *sociodemographic*, and *disease- and treatment-related factors*. The model illustrates how SA and RTW could be impacted through various efforts. Interventions aimed at improving *physicians'* sickness certification practice, as well as interventions involving also *other healthcare professionals*, could thus in theory affect the woman with BC, depicted in the middle of the arena, having encounters with different healthcare professionals.

There are also many factors which were not extensively addressed in the four studies. The legislative and insurance system may have influenced both the experience of encounters regarding work and RTW, e.g., certain recommendations for duration of SA after BC surgery might have influenced SA and RTW. In Study II, a stratification for changes in regulations was done, but did not show significant difference between those included before and those included after the change of regulations. Workplace factors, e.g., possibilities for adjustments of the workplace might also be of importance.

Further, the disease course for women with BC can be discussed based on a theoretical model illustrating a relationship between the health-related concepts; sickness, disease, and illness (217). These terms cover the experience of the disease- and treatment-related factors mentioned in the framework. Regarding women with BC, the tumor is often detected by screening in early stages before showing any symptoms for the disease (83). Women with BC might have a strong experience of health, especially around the time of diagnosis since at that time they have not experienced side-effects from surgery and other treatment. According to the theoretical model for health-related concepts, the period after the diagnose is set, could then be described by; disease as the pathological and biological process of having a BC diagnosis, illness as the subjective sense of not feeling well caused by side-effects related to surgery and treatment, and sickness as the role which is given in social perspective when being SA from work (217). All these aspects might have an impact on how women with BC actually are encountered regarding work by the healthcare professionals. The understanding of the experience of health-related concepts means that healthcare professionals can provide better support so that women with BC can manage their illness better, which might increase the quality of life for these women including their conditions for RTW.

6.3 METHODOLOGICAL CONSIDERATIONS

This section summarizes the methodological considerations for Studies I-III, and separately for Study IV. More and detailed information can be found under the various aspects of validity.

6.4 STUDY I-III

A strength in these studies was the use of nationwide survey data giving access to a randomly selected population-based samples regarding both oncologists and women on long-term SA, and longitudinal data from a relatively large cohort of women of working age with BC. Concerning the internal validity of the studies, there are three general aspects which can violate the credibility of the conclusions, namely: confounding, selection bias and information bias (190). When conducting studies, e.g., on survey-data, also two specific types of information bias: recall bias and loss to follow-up, are usually mentioned as aspects impairing the internal validity (218). The external validity or generalizability concerns the validity of the conclusions with regard to persons outside the source population (190). Internal validity is, however, a prerequisite for external validity.

6.4.1 Confounding

In Study I, the background factors of age, having received a board specialty and years at the current workplace, were considered potential confounders. It was conceivable that both age and number of years in the profession could have affected how the oncologists experienced their work tasks, e.g., the number of years in the profession might have given certain experience, and having experience could mean that they to a lesser extent experience the work as problematic. However, the background factors were not included in the final analyses of associations, as they were not statistically significant in initial analyses.

In Study II, the analyses were adjusted for several clinical: type of surgery, therapy given, relapse, as well as for sociodemographic variables (age, educational level, country of birth) and self-rated health at baseline. There is a known dependency between staging and treatment regarding BC (85) - the more advanced the tumor, the more advanced also the treatment. Therefore, only treatment variables and not TNM classification were included as adjustment.

In Study III, except for sociodemographic factors, depressive symptoms were considered a potential confounder, and treated as such in the analyses. However, depressive symptoms could also have had a moderating function. This since depressive symptoms might also influence both the experience of encounters, how to respond in a survey, and also how the patient actually was encountered by the healthcare professionals. However, this was not further investigated in this study due to the limited statistical power among women on SA due to BC.

6.4.1.1 Residual confounding

In the analyses of the respective studies, as always in all observational studies, there was a risk of residual confounding both from unmeasured factors and factors not measured perfectly.

In Study II and III, information on aspects of work which is important when considering SA and DP, was not included in analyses. Encounters from the healthcare professionals could e.g. reflect their understanding of possibilities for adjustments at work, e.g., some women with

BC may not have been able to RTW because their work involved heavy lifting or there was a high risk of infections.

The time period for the collection of the data in Study I-III range over 10 years, meaning that a number of changes during the time-period might also have influenced the results. Oncology is a medical field which have had a quick development concerning treatment, and the survival rates have increased over the last decade, both globally (15), and in Sweden (16). There have also been several changes in sickness certification regulations since the beginning of the covered time period. A large regulation change was made in 2008 (219). Concerning the change of regulations in Study II, an analysis was conducted stratifying on year of inclusion. The crude ORs for two of the encounters regarding work and long-term SA remained statistically significant before the regulation change but not after. However, the CIs were overlapping, a difference can thus not be claimed. There are no indications that how sickness absentees experience different types of encounters have changed over the time period, despite the development of new treatments.

6.4.2 Selection bias

Selection bias occur if the sample included from a population does not represent the population (190). In study I, the survey was sent to all physicians working and living in Sweden, with similar response rates over different regions giving a sample of oncologists working in different contexts. Regarding study II, only women who could read the comprehensive questionnaire in Swedish and were patients at the BC clinics in a large city were included. However, what is not known is if the women who chose to not participate in the study had more advanced disease or had more side effects of their treatment, and thus unable to respond or the opposite. There were no significant differences either concerning age between participants, nonparticipants or those who were missed due to administrative failures, or regarding socio-demographic or medical data between those who answered the questionnaire at all six survey times and those who missed one or more assessments. In Study III, the survey was sent to a random sample of half of the women on long-term SA in Sweden at that time. Given this nationwide design and a response rate of 55.4% among women, the sample was assumed to represent the population on long-term SA, being able to read in Swedish. However, as in most surveys, the response rate was lower among those with lower education, of lower ages, and among those with country of birth other than the host population (220, 221).

The impact of possible selection bias for Study I-III is difficult to estimate, it might have led to both under and overestimations. By using register data, analyzes could be conducted regarding non-responders, but it was not possible to contact them. This means that there could be a response bias among those who responded, e.g., more oncologists who were satisfied with their organizational conditions could have chosen to answer the questionnaire compared to those who were dissatisfied, as well as concerning the women with BC, those who had experienced positive encounters might have responded to a greater or lower extent.

6.4.3 Information bias

Information or measurement bias includes misclassification, which can occur when measuring either the exposure or the outcome (190). One way to handle this was by using questionnaires based on empirical and theoretical studies, but also by using register data for background characteristics. Information bias is categorized as non-differential if the probability of misclassification is the same for all subjects, and differential if the probability differs. Differential misclassification is not seldom introduced via recall bias. Since part of the data were self-reported and the responses were given retrospectively, there is a potential for recall or response bias. Self-reported responses are not objective measures, and they are expected to be influenced by the characteristics of the person answering the questionnaire. In Study II, this risk might be less pronounced due to a longitudinal design. Further, in Study II, there was no information about the first 14 days of SA spells, which can be seen as an information bias. However, the fact that SA can be measured in a number of ways is mainly a concern when it comes to external validity.

Further, missing responses that is missing information for some participants, is a problem often occurring in survey studies. In Study I: internal missing responses were 4.7% for the specific questions studied. In study III the internal missing responses were 1-12% for the specific questions studied.

6.4.4 Generalizability

Due to the nationwide and partly longitudinal design, most of the results from the included studies in this thesis are generalizable among oncologists and among women with BC in Sweden. The results concerning oncologists, are partly generalizable in countries with social insurance systems similar to the Swedish. Regarding study II, only women from a BC clinic in a large city were included. However, the county of Stockholm also includes less populated areas, including islands, and villages around the city. Nevertheless, they cannot be considered as fully representative of the population in Sweden. The results concerning women with BC, might be generalizable among women in other countries with a high labor force participation even in higher ages. As the course of events during and after treatment does not differ between countries. In addition, the results may change over time as the treatment for BC further develops or if there are major changes in legislation affecting the sickness certification.

6.5 SYSTEMATIC REVIEW WITH META-ANALYSIS

A review might sometimes be a collection of data with remarkable heterogeneity, and in that case a narrative synthesis is the only possible way of aggregating the data. A quantitative synthesis might in such instances result in a false impression of consistency. Even if there is no consistency between the studies, documenting that the current literature supports no inference is valuable (190). Meta-analysis is a quantitative design which is used to assess previous research and offers a more precise estimate of outcomes than an individual study (222). Meta-analysis enables the combination of data and to summarize

results from several studies, which is useful when having many small or medium-sized studies hampered by low power (223). As in all studies, there is also potential for different sources of bias when conducting a systematic review with meta-analysis.

6.5.1 Potential bias

To handle study-selection bias, the search in present review was performed in two databases which were assumed to cover most of the relevant publications with the specified inclusion criteria. However, it cannot be ruled out that a limitation to those two, and including only publications in English language, can have led to exclusion of some relevant studies. To handle further study-selection bias, the screening was conducted by two of the project members independently, applying blinding at the screening stage, and consulting a third member for any discrepancies at the final selection stage.

Publication bias as a result of, e.g., unpublished studies due to non-significant results or small sample size would lead to that studies identified and included in analysis might differ from those unidentified/ unpublished. However, in light of the inclusion of several rather small intervention studies, the impact here could possibly be argued to not be very large. Further, all interventions despite the sample size were included, which might have introduced a risk of influence of divergent results from small studies, however, that was not apparent in sensitivity analyses.

Although a formal quality assessment was not performed, it was perceived that the quality was probably rather low among the included interventions due to several aspects, namely: very small sample size (less than 20), high dropout rate (50%), high contamination risk among the included interventions, lack of information of physicians' involvement in the intervention and/or design, or that some of the interventions were controlled or randomized on patient level and not on physician level. In most of the interventions, the same physician who sickness certified was part of the intervention, but in some studies that was unclear as the patient may have been on SA already for a long time.

The grouping of the intervention contents as well as the grouping of outcome measures were challenging. This since the interventions varied in content, e.g., concerning length of the training which varied from 1-day workshop (202, 203) to continuous monthly meetings (197), and one-year postgraduation course (196). A great amount of outcome measures was observed among the included interventions, a problem that has also been highlighted in previous reviews within the insurance medicine field (1, 26-29, 111). This might be a big concern when combining outcome measures to be summarized in a meta-analysis. The risk is that two individual measures using different outcome measures may look similar and consequently be grouped in the same category but in reality, if having used the same outcome measure, be different. Regardless of the fact that there were variations between interventions regarding content and in how the outcomes had been collected or measured, the different terms used for estimating probability of SA and RTW, was considered to be comparable and included in a meta-analysis. A random-effect models were used since it was assumed that the

true effect size might differ from study to study, that heterogeneity was constant over time and not correlated with independent variables. For example, the interventions varied in intensity, and the participants might have varied in age, education or severity of their disease. Random-effect models contribute to control for such unobserved heterogeneity (190, 222).

The included interventions were conducted during the time-period 2005 through 2017. However, the differences seemed to be more related to the content of the intervention, healthcare system and social insurance system, than time. The influence of differences in content were explored in stratified meta-analyses.

6.5.2 Generalizability

The generalizability of this systematic review with meta-analyses is limited due to the fact that the sickness insurance systems as well as the structure of the healthcare organization differ among countries and over time. There are differences in when the sickness absentees need to have a sickness certificate from a physician, e.g., in Sweden it is after the 7th SA day. Further, in Netherlands, the interventions targeted mostly OPs, a medical specialty who handle the sickness certification comparing with, e.g., the Swedish system where all physicians can sickness certify. No interventions outside European countries were included, which might be due to that, e.g., the management of SA in USA and Canada to a large extent is the responsibility of employers and the existing interventions are mostly workplace based (224). However, since there are only three countries represented among the studies, the transferability of the results is limited.

6.6 ETHICAL CONSIDERATIONS

The ethical considerations of this thesis largely concern possible violations of personal integrity. Three of the studies are based on survey data, collected from participants, linked to data from medical files and/or registers. All participants were informed about the purpose of the study, and that participation was voluntary, and that they could withdraw their consent to participate. The participants were also informed that they had the right at any time to withdraw from the study and that this would not affect the oncologists' work situation, or the healthcare for the women, who were invited to the studies. When it comes to having given consent to participate in each study, an answered questionnaire which the participant had sent in, was regarded as informed and active consent.

When processing the data, only de-identified data was used by the research group. Further, no others, including the healthcare professionals of the clinics, nor SIA staff have had access to the answers nor to who responded or not. All results are reported on group level so that individuals cannot be identified. Additional ethical considerations within the project concern the risk that participants could be identified and that their response could be attributed to them because of a unique profile, which can happen when certain groups are very small, consequently some smaller groups were collapsed, or not shown at all to prevent this.

Participation in the studies might have been perceived as a possible burden, because it took time for the participants to answer the questionnaires, especially in Study II with the longitudinal design. However, the high response rates compared to similar studies implies and that this was considered important information to share with researchers.

Regarding Study IV, the data consisted of ethically approved and already published material. Moreover, during the extraction of data and during the analyses, considerations were taken to give justice to the results from each specific publication.

7 CONCLUSIONS

The results in this thesis contribute to the knowledge of oncologists' sickness certification practice and on how women with BC and other SA diagnoses experience encounters with healthcare professionals, knowledge needed to develop clinical practice. It is important to have both the perspectives of the oncologists and the women with BC. The oncologists expressed a certain lack of organizational prerequisites which could affect their sickness certification of patients. This might impact on encounters regarding SA and work issues, which have been found to be important for SA and RTW among women with BC.

It is worth noting that the oncologists report a need for strengthening of the organizational prerequisites, namely: training, joint routines/policies, instruments, time for work with sickness certification tasks, time for competence development, and support from immediate management at the clinic. It can be argued that strengthening the organizational prerequisites might also facilitate the oncologists' work with sickness certification.

The results further confirm that not only disease- or treatment-related factors, but also how women with BC experience being encountered from healthcare professionals impact their work and SA. Thus, it is of importance to further develop professional competence regarding communication with patients, competence involving knowledge, skills and attitudes. Positive encounters were observed to influence the women's notion about ability to RTW, both among those with long-term SA due to BC and due to other SA diagnoses. Consequently, the focus should be on strengthening the positive encounters in connection to SA.

The results of the systematic literature review indicated that physicians' sickness certification practice might be influenced, however, in both intended and unintended direction. Overall, the summarized relative risk indicated a small effect on RTW among patients. However, both content and outcome measures varied considerably between the interventions. Thus, to further contribute to the knowledge, it is important to document the interventions being implemented, evaluate them scientifically and publish them in international journals, and to use the same measures across studies.

8 IMPLICATIONS FOR FUTURE RESEARCH

It was found that several sickness certification tasks were experienced as problematic by oncologists, and that only one third of the oncologists had established joint routines/policies regarding handling sickness certification aspects at their clinic. It can be hypothesized that lack of these prerequisites are shared with other healthcare professionals, and influence also their ability to professionally perform their work with encounters regarding SA and work. Therefore, intervention studies in oncology healthcare settings concerning programs to improve the organizational prerequisites such as implementation of guidelines or routines, and development of competence regarding aspects of work and SA are warranted. This in order for oncologists being able to perform their work with sickness certification tasks professionally, and, when possible, promote RTW, especially among women with BC.

Both findings from Study II and Study III show that not only medical treatment but also how patients experience encounters with healthcare professionals may influence their ability to RTW. Long-term SA among women with BC, when the adjuvant treatment would be expected to be finished (except for hormone therapy), might be associated with disease and treatment, as shown in study II. Persisting symptoms are one potential explanation for that association, considering that women with BC have reported symptoms from treatment even ten years after treatment cessation, but SA could also be associated with factors not included in the analysis. It needs to be investigated further if other factors as, e.g., work conditions or concerns about future life conditions might have an impact on experience of healthcare professionals encounters regarding SA and work among the group of women with BC on long-term SA.

In Study III, it was found that women in higher ages (55-65 years), with other SA diagnoses than BC, differed in their experience of positive encounters promoting ability to RTW compared to younger women. In Sweden, women in higher ages are usually part of the work force, therefore, it is important in future studies to elucidate whether the encounters regarding work are influenced by how established women are on the labor market or by the expected remaining time of working life. It was also found that women with BC shared the experiences of encounters with healthcare professionals, thus, more knowledge is needed especially considering the high survival rate among women with BC. Furthermore, studies in other countries are needed to elucidate how experiences of encounters affect SA and RTW among women with BC, given the differences in health care and social security systems, and also in terms of women's employment rate, at different ages.

As a base for interventions, also studies with information from healthcare professionals, both oncologists' and other professionals', regarding their experiences of encounters regarding work, are needed to improve advice and information to women with BC. Since various laws and regulations have an intention to influence SA and/or RTW, these as outcome measures may also be linked to other outcome measures, such as adherence to guidelines, and to knowledge, skills and attitudes regarding sickness certification practice. That in turn means

that, an intended effect of an intervention could be captured if using, e.g., adherence to guidelines, knowledge, skills and attitudes regarding sickness certification practice as outcome measures. Although the number of interventions aiming at influencing physicians' sickness certification practice has increased, the number of scientifically evaluated and published studies is still low given that this is a common task among physicians. This means that many of the extensive interventions that have been made and are ongoing in, e.g., Sweden around this topic need to be evaluated and published. Furthermore, although physicians are the healthcare profession having the most central role in the SA process, also several other professions are involved, such as nurses, physiotherapists, hospital social workers, occupational therapists, psychologists, and others. These professions also have a need for more competence in insurance medicine. Consequently, to increase the scientific knowledge in the field, more and better interventions with comparable outcome measures are needed.

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