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Martin Inge Standal

# Cross-diagnostic aspects in the early stage of long-term sickness absence: A description of experiences, prognostic subgroups for return to work, and work participation

**NTNU**  
Norwegian University of Science and Technology  
Thesis for the Degree of  
Philosophiae Doctor  
Faculty of Social and Educational Sciences  
Department of Psychology



Norwegian University of  
Science and Technology



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Thesis for the Degree of Philosophiae Doctor

Trondheim, April 2021

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## Summary

Prolonged sickness absence is costly for society and associated with adverse health outcomes for the individual. After the first few months sick-listed workers have a decreased relative likelihood of returning to work. Thus, interventions after 8-12 weeks of sick leave are often recommended to assist the sick-listed worker back to work. Evidence suggests that similar principles for return to work can be utilized independent of disorder. However, more knowledge regarding cross-diagnostic aspects is needed at this relatively early stage of long-term sick leave. Thus, the aim of this thesis was to provide descriptions of the early stage of long-term sick leave in a cross-diagnostic sample in order to inform early return to work interventions and early return to work follow-up. This was performed through observational descriptive methods in three papers exploring three different aspects of early long-term sick leave.

Paper 1 aimed to explore psychosocial aspects of sick listed individual's experiences with being on sick leave after 8–12 weeks of sickness absence, and expectations and thoughts about returning to work.

Paper 2 aimed to identify and describe common subgroups of long-term sick-listed workers, across diagnostic categories, based on prognostic factors for return to work.

Paper 3 aimed to explore whether individuals on part-time sick leave and full-time sick leave differ in health, workplace resources and individual resilience while also considering known factors that influence part-time sick leave selection.

The findings from these papers are then situated in the current biopsychosocial understanding of work disability and discussed in relation to research evidence on return to work, as well as current practices for return to work follow-up in Norway.

Participants in this thesis were workers sick listed for eight weeks with a sick-listing degree of 50-100% and any diagnosis, which were recruited to participate in a randomized controlled trial. Three distinct designs and methodological approaches utilized this cohort in order to answer the three aims of the papers. All data in this thesis was cross-sectional and collected at inclusion into the trial.

Paper 1 explored psychosocial experiences with early long-term sick leave using semi-structured individual interviews of 16 individuals sick-listed for 9-13 weeks. Three themes were identified: (1) energy depleted, (2) losing normal life, and (3) searching for a

solution. The results found common experiences across disorders of being depleted of energy due to a combination of health, work or family strain. The second theme described how being sick listed was experienced as an abnormal, undesirable situation that was also accompanied by social difficulties. The third theme described how participants required assistance to find solutions to make progress towards returning to work. The study found that some lacked solutions to their challenges and consequently experienced uncertainty in how they would return to work. The paper goes on to discuss the interactions and strain that occurred between different social roles, and the social expectations of sick-leave behavior. Furthermore, uncertainty in the return to work process and the difficult trade-off between the necessity of continuing sick leave and returning to work to normalize the situation was discussed.

Paper 2 used latent class analysis to find subgroups for return to work based on prognostic factors for RTW independent of diagnosis. The study included 532 workers which were grouped into four distinct subgroups, or classes. Class 1 was characterized by favorable scores on the prognostic factors, while Class 2-4 revealed poorer scores on the prognostic variables with recognizable challenges for each class. The paper discussed that the findings may be comparable to prognostic subgroups found in musculoskeletal disorders. The findings also indicate that identifying cross-diagnostic subgroups based on return to work prognosis may be feasible, but more research is needed to determine the predictive validity and reliability of the subgroups.

In Paper 3, differences between individuals on part-time sick leave and full-time sick leave were examined. The paper investigated differences with regard to health-related factors, workplace factors, and personal resilience, while also considering factors that have previously been found to influence part-time sick leave selection. The sample consisted of 661 sick-listed workers and differences were examined using logistic regression. The part-time sick leave group included more women, more individuals with higher education, and fewer with physically demanding work than those on full-time sick leave. A reverse U-shaped curvilinear association between self-reported health and part-time sick leave was also identified. In addition, those on part-time sick leave had greater workplace adjustment latitude, psychosocial work environment, and work autonomy. These differences persisted after adjustment for known selection factors. The study discussed that the findings largely corresponded with previous research with regards to previously known selection factors. Furthermore, the implications of differences between the groups with regards to workplace resources that are not captured by register-data were discussed.



In summary, the findings described the complex biopsychosocial interrelations between health and work disability in the early stage of long-term sick leave. Several principles that guide return to work, such as workplace flexibility and graded return to work seem important at this stage independent of diagnosis. Furthermore, the findings indicated that individuals differed in their uncertainty of return to work and with regards to factors associated with return to work prognosis. Thus, a stratified approach with early identification of those at greatest risk of long-term sick leave could be sensible in order to allocate resources based on need and specific barriers to return to work. The findings in the papers suggest that such an approach should not only focus on health and symptoms, but also focus on workplace flexibility, while considering beliefs, perceptions, and the social context surrounding the worker. Current practice of early return to work follow-up in Norway contain structures that capture many of the aspects identified in this thesis, such as early identification of work capabilities, promoting workplace adjustments, and graded work resumption. However, the structures that exist may not be able to identify those with low work flexibility or who are lacking solutions to challenges in the non-work domains at this stage. Further research is needed to investigate the predictive validity of the findings in this thesis on sustained return to work. Conceptual replication is also needed to ensure that the experiences and results found are valid, reliable, applicable in other settings, and can be appropriately used to inform early cross-diagnostic return to work interventions and follow-up.

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## Acronyms and abbreviations

BPI – Brief pain inventory

CAGE – Cut, Annoyed, Guilty, Eye-opener

CI – Confidence interval

EQ-VAS – EuroQol visual analogue scale

GAD-7 – General anxiety disorder-7

GP – General practitioner

ICPC-2 – International classification of primary care second edition

ICF – International Classification of Functioning, Disability and Health

ISI – Insomnia severity index

LCA – Latent class analysis

NAV – Norwegian Labor and Welfare Administration

NTNU – Norwegian University of Science and Technology

OR – Odds ratio

PHQ-9 – Patient health questionnaire-9

PHQ-ADS – Patient health questionnaire anxiety depression scale

RSA – Resilience scale for adults

RTW – Return to work

RTW-SE – Return to work – self-efficacy

WAI – Work ability index

## List of papers

- I. Martin Inge Standal, Vegard Stolsmo Foldal, Roger Hagen, Lene Aasdahl, Roar Johnsen, Egil Andreas Fors, Marit Solbjør.

**Health, work and family strain - psychosocial experiences at the early stages of long-term sickness absence.**

*Submitted. In review.*

- II. Martin Inge Standal, Lene Aasdahl, Chris Jensen, Vegard Stolsmo Foldal, Roger Hagen, Egil Andreas Fors, Marit Solbjør, Odin Hjemdal, Margreth Grotle, Ingebrigt Meisingset

**Subgroups of long-term sick-listed based on prognostic return to work factors across diagnoses – A cross-sectional latent class analysis**

*Submitted to Journal of Occupational Rehabilitation. Accepted 27.09.20.*

- III. Martin Inge Standal, Odin Hjemdal, Lene Aasdahl, Vegard Stolsmo Foldal, Roar Johnsen, Egil Andreas Fors, Roger Hagen

**Workplace resources important for part-time sick leave selection – an exploratory cross-sectional study of long-term sick listed in Norway**

*Submitted. In review.*

# 1. Background

## 1.1. The value of work

Work is one of the most important areas in people's lives. The right to work, and under favourable conditions, is recognized by the United Nations as a human right. The United Nations grounds the statement in the belief that employment is central to being human [1]. Work meets important psychosocial needs, is important for an individual's identity, and includes therapeutic elements that can be beneficial for mental health and well-being [2-4]. Although there are some instances where work can be bad for the workers' health, work is generally good for the individual [2]. In Norway, there is political consensus that participation in work should include as many as possible [5] and employment rates in Norway are among the highest in the OECD [6].

## 1.2. Work disability and sickness absence

Work disability resulting in sickness absence is a significant challenge in developed countries [7]. Work disability is costly for society through disability and sickness benefits. For instance, 5.5% of GDP in Norway is used on disability and sickness benefits [8], which amounts to approximately 95 billion NOK and 72 billion NOK for the two benefits respectively in 2019 [9]. In addition, the indirect costs due to reduced productivity are estimated to be an even greater part of the economic burden [10].

Disability can be understood as the result of a dynamic relationship between an individual's health, personal factors and the environment in which an individual lives, and is expressed by activity limitations that impact experiencing life [11]. Similarly, work disability can be viewed as an inability of the worker to meet the requirements of their job due to a health condition while also considering influencing contextual factors [12]. Disability may lead to work disability which consequently can result in temporary disruption from participation in the work force, i.e., sickness absence.

### 1.2.1. Long-term sickness absence

There is consensus in the field of work disability that there is a qualitative difference between short sick leave spells and long-term sickness absence. Short spells are dominated by

respiratory infections and virus diseases while long-term absence is dominated by musculoskeletal and common mental disorders [13]. However, the threshold for short or long-term sick leave varies. For instance, the National Institute for Clinical Excellence define long-term sick leave as sick leave spells lasting more than four weeks [14]. In Norway eight weeks is often used as work activities are demanded by legislation at this point [15].

Long-term sickness absence, in addition to the societal costs, has also been associated with negative consequences for the individual [12]. For instance, it is problematic for the individual as the reason for absence is often due to poor health and functional limitations. Work is also the main source of income to support themselves and their families for most individuals, and work disability is linked to loss of income and medical costs [16]. Socially, sickness absence has also been associated with inactivity and isolation [17].

**1.2.2. Sickness absence by the numbers**

In Norway, medically certified sickness absence has been at around 5% of working days the last fifteen years [18] (see Figure 1). The sickness absence rate in Norway is the highest among OECD countries [19].

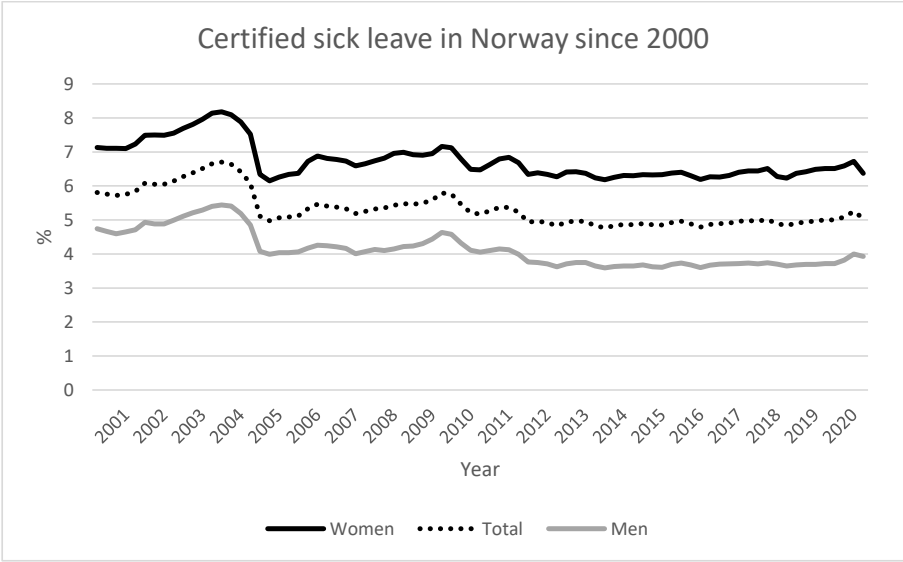


Figure 1. Medically certified sickness absence adjusted for seasonal variations and coronavirus-diagnosis. Source: *ssb.no*.

For medically certified sickness absence, the most common diagnoses are musculoskeletal and mental disorders (categorized by International Classification of Primary Care, ICPC-2 [20]), which make up almost 60% of working days lost in Norway (in 2019) [21]. Musculoskeletal and mental disorders are also major causes of disability in the Nordic countries [22] and worldwide [23]. In Norway, the yearly incidence of mental health disorders have been estimated to be around 16-22% [24], while at any time 23% report having a chronic musculoskeletal disorder [25]. These common health complaints have considerable comorbidity and overlapping symptoms [26, 27] and for the long-term sick listed, multiple and fluctuating health conditions are common [28]. Musculoskeletal, and mental health disorders are also among the most researched, indicating the great socioeconomic and individual burden that these disorders have [29].

### 1.3. Concepts of health

The definition of (work) disability as ill health in combination with contextual factors causing limitations that prevent experiencing life (or meeting the demands of work) invites another question: What is meant by health?

Concepts of health have been long debated. For centuries the dominant conceptualization of health was what is now referred to as the biomedical model. This model can be said to originate from Descartes' machine model of the human body in the 17<sup>th</sup> century [30]. In the biomedical model, symptoms and ill health are caused by abnormalities in the body that when removed means return to health [31]. Consequently, in this model health has been often equated with the absence of disease [30]. Based on a biomedical model, Talcott Parsons developed the sick role theory in the early 1950s which influenced how the medical profession and society viewed illness behavior [32, 33]. For Parsons the sick individual should accept his sickness and rely on the treatment of his physician in order to recover from illness. Depending on the severity and chronicity of the illness, the sick individual is largely exempt from normal social roles, and should withdraw from society and enter a "sick role" in order to recover as fast as possible [33]. The biomedical view, while being useful for many disease-based illnesses, has been criticized as being reductionist, and not applicable for many chronic illnesses and illnesses where an identifiable cause cannot be found [31].

The biomedical model was contrasted in 1948, when the World Health Organization (WHO) pointed to the absence of disease as insufficient, and described health as a state of complete physical, mental and social well-being [34]. However, this definition has also been criticized, mainly for being unattainable [35]. An increasing number of individuals live with disabilities, for instance due to improvements in survival rates for several diseases [36]. Furthermore, symptoms are very common in the general population [30]. This means that a health-definition including complete well-being would arguably make most individuals unhealthy most of the time [37]. A more pragmatic definition of health have been proposed by the WHO Ottawa Charter for Health where health is a resource for everyday life, used for reaching aspirations and needs, and to adapt, change and cope with the environment [38]. In this view, more focus is put on social and personal resources, and health cannot be obtained by medical treatment alone [38]. Arguments have also been made that any definition of health cannot capture its complexity [39], and that concepts of health needs to be framed in the setting where it is used [40].

#### **1.4. Concepts of work disability**

The definition of health in the setting of work brings us back to the definition of work disability as the inability to meet the demands of work due to a health condition while considering contextual factors. Three major theoretical views have shaped the development of models of disability: biomedical, social construction and biopsychosocial [41].

Historically, the causes of work disability have also relied on a biomedical view. In this view disability is caused by a health condition which requires medical care [42]. Biomedical models may work for explaining work disability due to uncomplicated illnesses but as work disability is influenced by personal and contextual factors, this model lacks support to describe work disability in full. For instance in medically unexplained symptoms in which no physical pathology can be found, and psychological and environmental factors are important for functioning [43]. As a contrast to the biomedical model of disability, a social constructivist view has also been proposed. In the social constructivist models, disability is not an attribute of the individual, but is caused by the social environment [42]. The social constructivist models also have a unidimensional view of disability that largely disregard the individual's health and behaviors, and views the causes of disability due to social and environmental policies and practices [32].



Contemporary understanding of disability is often based on a combination of these models into biopsychosocial models. In a biopsychosocial model health is integrated into a system-based approach, and disability is a consequence of the interaction between biological, psychological, and social factors [42, 44]. Biopsychosocial models of disability can be said to have their origins from Engel [45, 46] and Nagi [47]. Engel stated in 1977 that (for the field of medicine) a biomedical model was not sufficient, and that inclusion of psychosocial factors was crucial [45]. A year earlier Nagi [48] had identified the poor correlations from impairment to work disability and proposed that functional limitations, and characteristics of the person and the environment played a role in whether impairments would lead to work disability. Biopsychosocial models take into account interactions that occur within the disabled worker, for instance between health and psychological processes, such as attitudes and beliefs. But also interactions in the wider context and between stakeholders such as the disabled worker, the employer, case managers, medical providers, the social environment and the political context where disability occurs [32, 44]. These factors are thus hypothesized to contribute to the etiology of disability, and also influence each other and impact the duration and severity of disability [44].

## **1.5. Models of work disability**

The biopsychosocial perspective on illness indicate a holistic approach to understand the complex context of individual disability. Many principles of work disability prevention and contemporary models of work disability have been formulated from this holistic perspective [32]. Two of the most influential biopsychosocial models used to illustrate work disability are the case-management ecological model [49] and the WHO's international classification of functioning, disability and health (ICF) [11], and will be presented briefly below.

### **1.5.1. The case-management ecological model**

The case-management ecological model provides an overview of the full arena of stakeholders involved in the disability process for an individual. The model does not attempt explain factors leading to disability, but provides an overview of the influences of disability in order to guide case-management to improve work outcomes [32]. The model shows the disabled worker at the center and the four main systems preventing or facilitating work.

These systems are also placed in the overall sociopolitical and cultural context, which also influence work disability and how the four systems interact [49]. This model offers a visual representation of the complexity of the influence that different systems have on work disability [32].

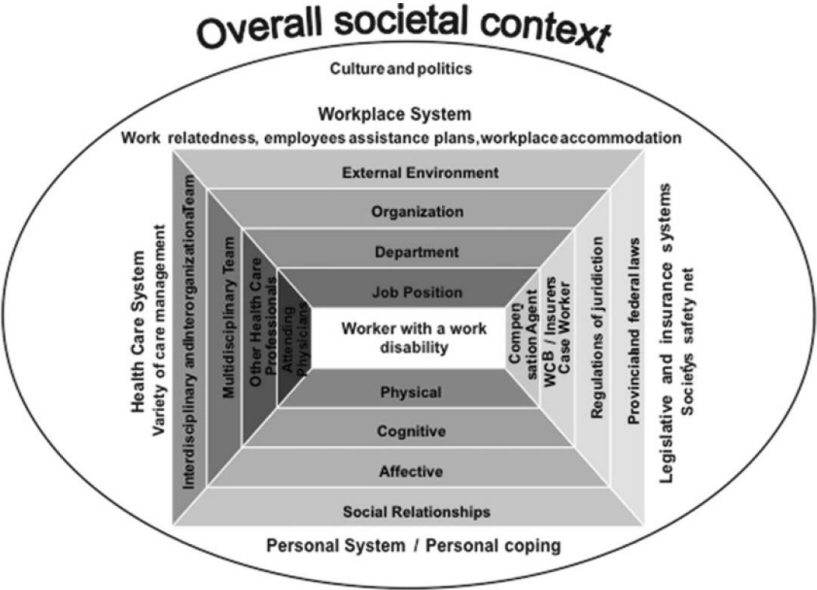


Figure 2. The case-management ecological model (Loisel et al., 2005) [49]. With permission from Springer.

1.5.2. The international classification of functioning, disability and health

The ICF model proposed by the WHO, describes disability as a lack of functioning in activities which is a consequence of the relationship between health, personal and environmental factors [11, 32]. The environmental factors are seen as external physical, social and attitudinal factors that can have a negative or positive influence on a person’s health and performance in society [32]. Even though a medical condition is at the center of the model, the social element is emphasized as disability largely is understood as a lack of functioning in society. Thus disability is a relational concept where health impairment lead to functional limitations which become disabling related to the broader social context [44].

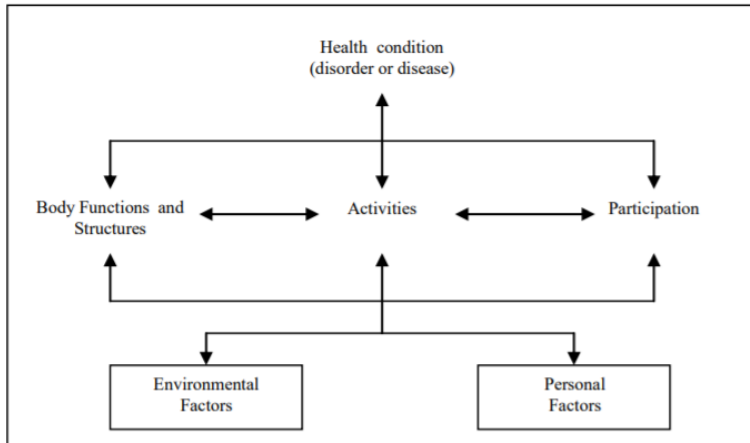


Figure 3. WHO ICF Conceptual model of disability [11].

### 1.5.3. Biopsychosocial models going forward

In the recent decades, understanding of disability has largely shifted from the biomedical to the biopsychosocial [41]. However, the problem with biopsychosocial theory is its universal essence and lack of specificity. This makes the models difficult to distinguish and also contributes to difficulties in operationalizing the interconnected parts of the models as testable hypotheses [44]. Biopsychosocial models of disability are still evolving, and through research and practice more knowledge of what works is constantly created [44]. While some biopsychosocial models, for instance the case-management ecological model, have been created from research on musculoskeletal disorders, biopsychosocial models in general arguably encompass a broad research consensus in rehabilitation. Thus, such models have been applied in practice for other medical condition where reducing work disability is desired [50]. Overall, the emerging biopsychosocial models of work disability are cross-diagnostic and oriented to how an individual function relative to the requirements of their work, while also considering the multitude of factors influencing this relationship.

### 1.6. Work disability and sickness benefits

The definitions of health and work disability may be philosophical in nature, but it is not only a theoretical issue. Health definitions impact how health is constructed in our

societies, which impact behavior and how we regard and aid those around us with ill health or disabilities [40, 51]. Furthermore, health and disability definitions may also have immediate and direct practical implication such as eligibility for sickness benefits [31].

Work disability can result in the individual's inability to work at full capacity. When this happens, many countries have implemented income replacements in the form of sickness benefits or similar systems in order to provide the financial backing for living and maintaining independence. See e.g., Chaupain-Guillot and Guillot [52] for an overview. In Norway, sick-listed individuals are eligible for 100% wage replacement for 52 weeks after which individuals need to apply for other benefits. The first sixteen days of sick leave benefits are covered by the employer while the remaining is publicly funded and paid by the National Insurance Scheme through the Norwegian Labour and Welfare Administration (NAV) [15].

These compensation systems have roots in the biomedical domain, and often have narrow disability definitions that require documentation of a physical or mental impairment, or evidence of discrimination [41]. For instance, in Norway diagnoses which fall under the diagnostic categories of social, economic and other life problems do not on their own make an individual eligible for disability benefits. However, social and other life problems can sometimes lead to illness classified in other categories, such as mental disorders, which would fall under legible reasons for benefits [53]. Thus, these systems have traditionally focused on individual capacities that reduce work ability and pay less attention to the surrounding work and psychosocial environment influencing work disability [54].

## 1.7. Return to work

Prolonged absence is associated with adverse health outcomes, multimorbidity and increased risk of permanent disability for the individual [2, 55]. Furthermore, progressively worsening work prospects over time due to increasing psychosocial disruption and loss of contact with the labor market have been hypothesized [56]. Thus, due to the benefits of working, and consequently the negative aspects of prolonged sickness absence, reducing sickness absence and promoting return to work (RTW) has been promoted as an important goal for societal and work policies (see e.g. Mykletun et al. [57] and Halonen et al. [58]).

Definitions of RTW has varied in the research literature. RTW have been used as both a process (i.e., returning a sick listed individual to work with interventions or

accommodations) and an outcome (i.e., the status of working or not working). Furthermore, RTW may refer to return to the same work or return to any work altogether, with or without accommodation [59]. What constitutes successful RTW also vary depending which stakeholder is asked [60]. Thus, the perspective of RTW vary depending on measurement and stakeholders involved. However, there seems to be growing consensus that sustainable work participation rather than time-specific RTW should be preferred due to the fluctuating and recurring nature of long-term sickness absence [60]. Furthermore, evaluations of RTW should take into account the frequent transitions between work and sickness absence [61]. Regardless, the challenge is to reduce work disability and promote work participation for sick listed individuals. Failure to RTW is often theoretically and operationally equated with permanent disability [44].

#### 1.7.1. Prognostic factors for return to work

In order to help individuals RTW, it is important to know why some return while others do not, and why some return faster than others. Common health problems may not be sufficient in themselves to explain long-term disability. As many of these disorders are manageable, recovery can be achieved given the proper advice and support [62]. Thus, identifying prognostic factors for RTW have been a focus for many disorders. Several studies and systematic reviews identifying such factors have been undertaken in defined diagnostic groups, such as musculoskeletal or pain disorders [63-67], mental disorders [68, 69], cancer [70-73], carpal tunnel syndrome [74], traumatic brain injury [75], and stroke [76]. However, some have also attempted to find common factors in those with chronic diseases [77], following workplace injury [78], associated with sustainable RTW [79], or simply across diagnoses [80-84].

This comprehensive literature reveals that there are several common prognostic factors for RTW regardless of diagnosis. For instance, perceived health [84], comorbidity, symptom severity [82], RTW self-efficacy [80], perceived work (dis)ability and RTW expectations [81, 82]. Prognostic sociodemographic factors are age, education, gender, and the demands of one's work [77, 81, 82]. As these factors for RTW are shared across disorders, arguments have been made that RTW is a general process [82]. Furthermore, as we have seen above, musculoskeletal disorders and mental disorders have overlapping symptoms and prevalent comorbidity. Diagnostic classification may alone not capture the information

needed for work participation [85], and psychosocial factors have been shown to be important when predicting work status for those with somatic conditions [86]. Thus, a cross-diagnostic biopsychosocial approach to guide work disability, regardless of the clinical nature of the disability has been proposed to be sensible [41].

### 1.7.2. Return to work interventions

In order to help individuals RTW, effective vocational rehabilitation interventions are required as healthcare treatment alone has little impact on work outcomes [87]. Vocational rehabilitation can be defined as “whatever helps someone with a health problem to stay at, return to and remain in work” (p. 5) [87], and its primary goal is sustained RTW [16].

Finding effective interventions to promote RTW has been attempted by many. For common mental disorders RTW interventions usually include collaboration between stakeholders, graded or part-time sick leave, therapeutic conversations (e.g. from psychologists, healthcare professionals, or RTW coordinators), and contact with the workplace [88]. Evidence indicates that multicomponent interventions including contact with the workplace and part-time sick leave is effective [89]. Furthermore, cognitive behavioral therapies with a work-related focus has shown effective for RTW for those sick listed due to depression [90]. For those with musculoskeletal disorders there is evidence that ergonomic interventions [91], workplace adaptations, behavioral change techniques and exercise programs could be beneficial [92]. For other disorders, such as cancer and traumatic brain injury, multidisciplinary interventions that are work-directed and include psychoeducation and/or skills training seem effective [93, 94].

#### 1.7.2.1. Cross-diagnostic return to work interventions

Some have also attempted to identify what defines effective RTW interventions across disorders. Cullen et al. [95] find that multicomponent interventions which include a combination of healthcare, RTW coordination and work modification in general are more successful for both workers sick listed for musculoskeletal disorders and common mental disorders. Vooijs et al. [96] also found beneficial effects for interventions directed at work for people with chronic diseases. However, van Vilsteren et al. [97] only found an effect of workplace interventions for those with musculoskeletal disorders, and not for those with common mental disorders or cancer. Furthermore, Vogel et al. [98] found no effect for RTW

coordination programs across studies that include mainly musculoskeletal disorder samples, but also a few studies on those with common mental disorders.

The conclusions from these findings could indicate uncertainty around the effectiveness of intervention components that are thought to be important regardless of disorder (e.g. RTW coordination, and work-directed interventions). However, they could also indicate the difficulty in synthesizing effects across diagnoses using studies that often are designed for single diagnostic categories. Randomized controlled trials that have included participants across diagnoses are scarcer, but a few have been undertaken. Poulsen et al. [99] examined the effect of a Danish RTW program that included a multidisciplinary team, a biopsychosocial assessment of barriers and resources for RTW, and close collaboration with stakeholders. The effects of this program varied between municipalities from beneficial to detrimental for RTW and the authors suggest that contextual factors might have played a role. Another Danish study by Pedersen et al. [100] included participants at risk of a mental disorder for a psychoeducation intervention. The participants' self-reported reason for absence were largely mental health related (e.g., stress, anxiety, depression, and psychosocial work environment), but also included musculoskeletal disorders and other reasons. The study found no effect of psychoeducation compared to usual care. A Norwegian research project recruited participants sick listed with musculoskeletal, psychological, general or unspecified diagnoses. In this research, a short eight day and a long 3-4 week inpatient multimodal rehabilitation program were compared to outpatient group-based acceptance and commitment therapy sessions. The authors conclude that a short inpatient program provide little benefit over the outpatient program [101]. However, the comprehensive long inpatient program significantly reduced sickness absence compared to the outpatient program [102].

Despite the difficulty in finding effective cross-diagnostic interventions, attempts to promote RTW for those with common disorders have moved towards multi-domain interventions that include healthcare, the individual and the workplace [42, 60]. Overarching principles for vocational rehabilitation are a biopsychosocial orientation, work-focused healthcare, graded RTW, RTW coordination, and accommodating workplaces [103].

#### *1.7.2.2. Early interventions*

Part of the difficulties of finding effective interventions could also be the differences in timing of interventions. The concept of early intervention is central to vocational

rehabilitation as temporal distance from work is thought to increase the obstacles to RTW [104]. Every week, around 24 000 workers in Norway receive sickness certification for a new sick leave spell. Most of these RTW on their own within the first few months, but roughly 15% of these workers reach eight weeks of sick leave. One third of those at eight weeks will return to work within the next month, a third will take up to six months, and the final third will reach the end of 52 weeks of sickness benefits [105]. This means that after the first few months, individuals have a reduced relative likelihood of returning to work (See Figure 4). Thus, it is thought to be simpler and more cost-effective to prevent prolonged sick leave by intervening early [104]. Early interventions promoting RTW are also recommended by the Norwegian government [106].

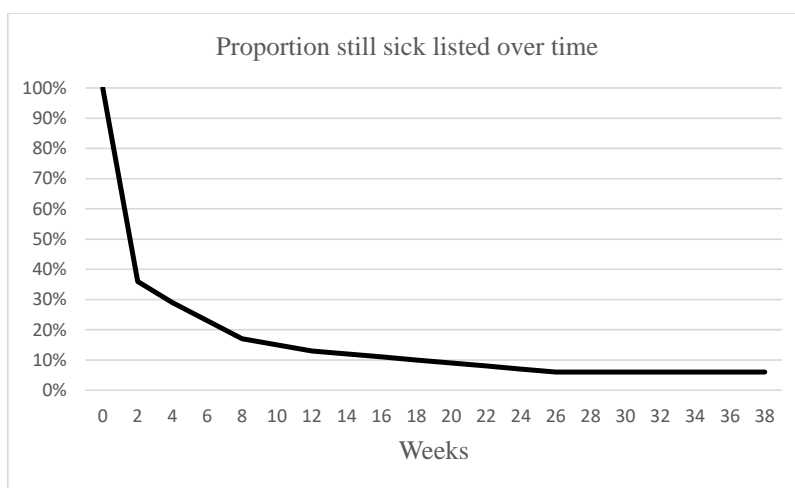


Figure 4 – Proportion of new sick leave spells by duration in Norway (first quarter 2019).  
Source: nav.no.

Research on mental health disorders have recommended early intervention to maximize the likelihood of RTW [107]. Evidence also suggests that intervening in the first few months is beneficial in musculoskeletal patients [92, 108, 109]. Furthermore, as prolonged sick leave is costly for society, interventions achieving early RTW could also be highly cost-efficient [10]. However, as most individuals RTW on their own within the first few months, too early interventions may not be cost-effective [110, 111]. Several RTW interventions in musculoskeletal patients have demonstrated cost-effectiveness as a result of earlier RTW, and a review of these have suggested that the optimal time window for interventions is at 8-12 weeks of sick leave [112].



### **1.7.2.3. Stratified care**

While the timing of interventions seem to be important, the content of the interventions and to whom they are provided should also be considered [113]. Aasdahl and Fimland [113] argue that a stepped care approach could be sensible, where simpler low-cost interventions are provided in the early stages, while more comprehensive interventions can be attempted at later stages. More focus should thus be put on developing appropriate measures at different stages, and early identification of those at risk of prolonged sick leave [113].

Most RTW interventions use diagnosis as a basis for recruitment, even though diagnosis provides limited information of the complexity and interrelationship between factors associated with prognosis [114, 115]. Using prognostically heterogeneous samples could dilute the effects of interventions, as effects are averaged across the sample, meaning some subgroups will have no benefit or possibly even experience negative outcomes of these interventions [116]. Thus, identifying subgroups based on risk of prolonged sick leave that can be used to stratify care could be a sensible approach. However, finding subgroups based on risk is challenging and has been a focus of research in some fields for many years, mainly in patients with musculoskeletal disorders [117]. Some tools have positive results, for instance the STarT Back Screening tool for low-back pain [118]. While not being designed specifically for RTW, it is a tool that uses prognostic indicators for disability to identify those at greatest risk of long-term disability. The goal is to provide the correct amount of follow-up based on long-term risk [119]. Another stratification tool is the PRICE tool, which was developed through studies using prognostic factors that identified subgroups based on risk of RTW [120-123]. The PRICE tool can be used to identify those with poor prognosis for RTW and also indicates where assistance should be focused for patients with back pain (e.g., the workplace, psychological coping, physical activation) [123]. Both tools have been made with regard to musculoskeletal disorders, and more specifically back pain. Given the considerable comorbidity and shared prognostic factors for RTW across diagnoses [26, 27, 82], a broader cross-diagnostic stratified approach might be a sensible endeavor.

### **1.7.3. Experiences of sick leave and return to work**

The research mentioned so far is almost exclusively quantitative, which usually averages experiences of a sample over the entire sample to find if the experiences in total

deviates from the expected, and to what certainty. Quantitative methods are thus less than ideal to provide in-depth understanding of the barriers and facilitators as experienced by the sick listed workers in the RTW process. Qualitative research can fill this gap, and enough descriptions of a phenomenon can be synthesized and used to inform the design and implementation of interventions [124].

Research on the experiences of sick leave and RTW is extensive. For instance, meta-syntheses of qualitative research show that individuals with common mental disorders found that sick leave causes a loss of control and instability in life, and that a supportive work environment was important for RTW [125]. Individuals with low-back pain describe the struggle of having their illness believed and validated by others, which can also contribute to withdrawal and a disruption of social life [126]. Those with chronic pain describe the difficulty in balancing their own needs with those of their colleagues and workplace [127]. These syntheses point to a disruption of social life, and the importance of a supportive workplace for RTW.

However, previous qualitative research on sick leave and RTW has commonly been performed with undefined or varied sick leave lengths [128]. These experiences may not be well-suited to inform early interventions as findings point to different experiences in the later stages than the early stages of sick leave [129]. Furthermore, while individuals in different subpopulations (e.g., gender, diagnoses or occupations) likely have different experiences of sick leave [130, 131], it is also important to know which experiences might be shared considering the large heterogeneity within, and similarities between, such groups [132]. Therefore, to complement the quantitative evidence, adding insights provided by qualitative research exploring cross-diagnostic experiences in the early stages of sick leave could be of value for the design and implementation of interventions.

## **1.8. The aim of the thesis**

There are some common principles that emerge with regards to RTW follow-up for those with work disability. The understanding of health and disability has moved from the biomedical to the biopsychosocial, and there is increasing evidence that the RTW process is largely general, regardless of diagnosis. Returning sick-listed workers to their job can thus possibly be undertaken with similar principles, regardless of health problem.

The evidence examining cross-diagnostic interventions for RTW is scarce, and at the early stages of long-term sick leave the evidence-base for such interventions are largely non-existent. The principles that guide RTW interventions are based on research not necessarily focusing on diagnostically mixed samples or the early stages of long-term sick leave. Cross-diagnostic approaches targeting common factors have been described as promising, and early interventions approaches are increasingly recommended, but both fields are still in their early beginnings [133]. Lately, there has been a call for research identifying aspects of the RTW process that are common across disorders, also contextualized by time, place, and surrounding systems [134]. The first step in developing empirically tested early cross-diagnostic interventions is by comprehensive descriptions of the circumstances in which they are applied [135].

Based on these arguments, the aim of this thesis was to provide descriptions of the early stage of long-term sick leave in a cross-diagnostic sample in order to inform early RTW interventions and early RTW follow-up. This was performed through three separate aims, corresponding to the three papers:

Paper 1 aimed to explore psychosocial aspects of sick listed individual's experiences with being on sick leave after 8–12 weeks of sickness absence, and expectations and thoughts about returning to work.

Paper 2 aimed to identify and describe common subgroups of long-term sick-listed workers, across diagnostic categories, based on prognostic factors for RTW.

Paper 3 aimed to explore whether individuals on part-time sick leave and full-time sick leave differ in health, workplace resources and individual resilience while also considering known factors that influence part-time sick leave selection.

## 2. Methods

### 2.1. Thesis context

This thesis is part of a larger research project which is funded by the Research Council of Norway (project number: 256633) and is a collaboration between NAV, the Department of Public Health and Nursing and the Department of Psychology at the Norwegian University of Science and Technology (NTNU). The main goal of this research project is to examine the effect of motivational interviewing provided by caseworkers at NAV on improved RTW [136]. This is performed through a randomized controlled trial conducted within NAV in Trondheim, Central Norway. The research project started in 2017 and is ongoing as of October 2020.

### 2.2. Follow-up of sick-listed workers in Norway

In Norway, employees are entitled to 12 months of full wage replacement when sick listed, capped at six times the national insurance basic amount (approximately 55 000 euro in 2020) [137]. The first 16 days of sick leave is paid by the employer and the rest is covered by the National Insurance Scheme through NAV [15]. For sickness spells lasting more than three days, or eight days for employees working for enterprises covered by the “Inclusive Work Life” agreement (see [5]), sickness certification from a medical doctor is required. The general practitioner (GP) is usually the first point of contact for those seeking sickness certification. The GP certifies sick leave and has a responsibility to assess whether work activities are possible, for instance part-time sick leave. Part-time sick leave, where employees work a percentage corresponding to their current work ability, is to be regarded as the rule rather than the exception for GPs writing sickness certification [53].

The employer has the main responsibility for assisting the sick-listed worker back to work [138]. By four weeks of sick leave, the employer and sick-listed worker are obliged to create a plan detailing measures which can help the sick-listed RTW [137]. Within seven weeks, a meeting between the sick-listed worker and employer is required [138]. By eight weeks work-related activities are demanded by legislation [15]. If work-related activities are not resumed within eight weeks an expanded medical certificate that documents medical problems preventing such activities, or documentation from the employer stating why work-

related activities are not possible, is required [139]. Work related activities can be part-time sick leave or measures initiated in cooperation with NAV [53]. The sick-listed employee has a duty to inform the employer of work-related functions and to participate in possible adjustments but has no obligation to disclose medical or private information [140]. Before six months have passed, a mandatory dialogue-meeting must be arranged by NAV. This meeting includes the NAV caseworker, the employer, the sick-listed worker and, in some cases the GP [138]. The sick-listed worker can, at any time, request a meeting with a NAV caseworker or request a dialogue-meeting that also involves the employer. NAV has a coordinating role in sick leave follow-up, and can also suggest interventions and work activities [138].

### 2.3. Study design

The thesis covers three studies carried out on the same sample population. Each study had a distinct design and analytical approach in order to answer its aim (see Table 1 for an overview).

*Paper 1* used a qualitative design with a descriptive phenomenological method to investigate how individuals experienced being on sick leave and thoughts about RTW in the early stages of long-term sick leave.

*Paper 2* used a quantitative cross-sectional design with latent class analysis (LCA) to investigate whether individuals sick listed for eight weeks could be placed into distinct subgroups based on prognostic RTW factors, independent of diagnoses.

*Paper 3* used a quantitative cross-sectional design and logistic regression to investigate differences between individuals on part-time and full-time sick leave. The study examined previously identified differences and factors that were proposed to differ between those on part-time and full-time sick leave.

Table 1 – Overview of the studies in the thesis.

	<b>PAPER 1</b>	<b>PAPER 2</b>	<b>PAPER 3</b>
<b>AIM</b>	Explore psychosocial aspects of sick listed individual’s experiences with being on sick leave after 8–12 weeks of sickness absence, and expectations and thoughts about returning to work.	Identify and describe subgroups of long-term sick-listed workers, independent of diagnoses, based on prognostic factors for return to work.	Explore whether individuals on part-time sick leave and full-time sick leave differ in health, workplace resources and individual resilience while also considering known factors that influence part-time sick leave selection.
<b>STUDY SAMPLE</b>	Sick listed individuals of working age (18-62) with a sick leave length of eight weeks, and 50-100% sick leave status. Any diagnosis.		
	<i>n</i> = 16 Included from Nov-17 to Feb-2018 81% female Age 32-59	<i>n</i> = 532 Included from Aug-17 to Oct-19 66% female Age 18-62	<i>n</i> = 661 Included from Aug-17 to Mar-20 64% female Age 18-62
<b>STUDY DESIGN</b>	Qualitative cross-sectional individual interview	Quantitative cross-sectional	Quantitative cross-sectional
<b>DATA</b>	Semi-structured interview with five main interview questions.	Self-reported electronic questionnaire and register-data.	Self-reported electronic questionnaire and register-data.
<b>ANALYSIS METHOD</b>	Giorgi’s descriptive phenomenology	Latent Class Analysis	Logistic regression

## 2.4. Recruitment and sample

Eligible participants for the papers in this thesis were all those included into the randomized controlled trial [136]. Eligibility for inclusion into the trial were workers aged 18–60 years living in and belonging to one of two NAV offices. These two offices covered the geographical areas of the northern and eastern parts of Trondheim, a city located in Central Norway. Inclusion criteria were eight weeks of sick leave with a current sick leave status of 50–100% and any diagnosis. Exclusion criteria were unemployment and pregnancy [136].

Eligible participants were invited to participate by NAV, which contacted workers sick listed for seven weeks through their electronic communication website. NAV's website is secure and requires personal id with two-step verification to access and through this website NAV can communicate securely with individuals. The invitation to participate to the project also provided participants with information about the project and prompted them to accept or decline participation (see Appendix A). The invited sick-listed individuals replied through the same website. For any questions, the sick-listed workers were asked to contact the researchers in the project, or NAV's project contact. If potential participants had not read the invitation by one week, they were sent a written reminder, and if they still had not answered for another three days, they were called by a NAV employee who reminded them of the message, and provided brief information about the project. After acceptance, a NAV employee checked the criteria for eligibility before sending the list of participants to the researchers [136].

During the period of data collection for this thesis, from August 2017 to March 2020, 5748 individuals were invited of which 852 (15%) accepted and received a web-based questionnaire by e-mail. All data in this thesis was collected at inclusion (or the following weeks in Paper 1) and prior to intervention. The three papers differed in their utilization of this sample due to being undertaken at different time points while inclusion was still ongoing. Note that a few participants were included in the trial that did not meet the criteria for participation. These participants were not excluded for the papers in this thesis, which means that seven included participants in Papers 2 and 3 had a pregnancy related diagnosis, and two participants were 62 years old.

#### **2.4.1. Paper 1**

In Paper 1, 73 participants who had consented to participation in the randomized controlled trial between November 2017 and February 2018 were contacted by the first or second author via e-mail and invited to participate in an interview about their situation on sick leave (see invitation letter and e-mail text in Appendix B). The aim of the study was to explore the participants experiences at 8-12 weeks of sick leave. Thus, participants were invited at eight weeks, and the interview was scheduled as quickly as possible. 16 individuals accepted the invitation and participated in interviews. All participants had been sick listed for 9-12 weeks except one (13 weeks) at the time of interviews. Written informed consent was obtained prior

to the interviews (see Appendix B), and no researchers in the study had any prior relationship with the participants.

#### **2.4.2. Paper 2**

Participants in Paper 2 were all individuals who had accepted the invitation and answered the questionnaire between August 2017 to October 2019. In this period 4708 individuals were invited, of which 709 (15%) accepted. The questionnaire was answered by 571 (81%) of the included participants, which was the eligible study sample.

#### **2.4.3. Paper 3**

Participants in paper 3 were those who had accepted the invitation and answered the questionnaire between August 2017 to March 2020. During which 5748 individuals were invited and 852 (15%) accepted. For this sample, the questionnaire was answered by 669 (78%) of the included participants. One participant withdrew their data from the study and seven participants had missing data on the outcome variable, leaving 661 in total for the analyses.

### **2.5. Researcher reflexivity**

Researchers are not objective observers of social phenomena, due to their positioning in the worlds they study [141]. Lack of credibility in the researchers can lead to questions regarding the validity of the research [142]. In qualitative research traditions it is common to reflect upon preconceived assumptions with regards to the field of study also known as reflexivity. Reflexivity can be viewed as an increased awareness of who the researcher is in the research process [141] and the researchers potential positions should be explicitly disclosed [143].

Personal reflections of my position in the research was undertaken prior to starting recruitment into the qualitative study. My background with regards to the field of study can be summarized as follows: Prior to starting this thesis I had little theoretical or practical insight into the field of sick-leave follow-up or occupational rehabilitation. Nor did I have any personal experience with being sick listed. My educational background in health and organizational psychology cause some psychological theories that influence behavior, such as



self-efficacy [144] and locus of control [145] to resonate with me. These theories could also relate to the RTW process, and possibly give me undue faith in work mastery and job satisfaction for the RTW process. Thus, prior to starting the research I assumed that many problems regarding long-term sickness absence and lack of RTW were due to psychological or social factors, such as lack of self-efficacy, low job satisfaction, or poor psychosocial work environment. I also assumed that many long-term sick listed would rather look for a different job than return to their present one.

## **2.6. Data collection, interviews and instruments**

Three data sources collected from different settings are used in this thesis. In the first paper, the qualitative interviews are held at the choice of one of two campuses at NTNU. The second data source was electronic questionnaires sent by e-mail where participants could be located at a place of their convenience (Paper 2 and 3). Finally, registry data on diagnosis (Paper 2 and 3) and sick leave degree (Paper 3) was obtained from NAV registries through a project coordinator in NAV.

### **2.6.1. Qualitative interviews (Paper 1)**

To answer the aim in Paper 1, data-collection through semi-structured individual interviews was chosen as they can provide a safe space for the participants to talk about their experiences [141]. Individual interviews were chosen over focus groups as group-based data collection methods can be difficult for sensitive matters (e.g. talking about sick leave, their employer, family issues) [141]. Furthermore, the study wanted to examine common individual experiences, and was not concerned with collectively constructed experiences or consensus-making which are strengths of group-based interviews [141].

In descriptive methods it is important to steer the participant towards the topic of interest rather than asking leading questions in order to explore the phenomenon as experienced by the participant and avoid bias [146]. Semi-structured interviews with broad questions can be useful to promote general descriptions from participants [141]. The semi-structured interview can be viewed as non-directive and the interview guide functions as triggers to encourage the participant to talk [141]. The interview questions used were created in collaboration with all authors based on a biopsychosocial understanding of long-term sick

leave. Follow-up questions thus addressed the context surrounding the sick-listed worker, such as potential other stakeholders in the RTW process. Prior to starting data collection for the qualitative study, we estimated the need for 10-15 interviews based on the concept of information power outlined by Malterud, Siersma and Guassora [147]. The necessary number of interviews for describing the phenomenon was evaluated consecutively from nine interviews until completion. No thematically new information was considered to be obtained from interviews 14-16 and the data collection was concluded at sixteen interviews.

## **2.6.2. Self-report electronic questionnaire (Paper 2 and 3)**

The electronic questionnaire was sent to participants by e-mail within the first week after inclusion, and reminders were issued to those who had not completed the questionnaire after four and eight days. The questionnaire contained a total of 121 items (see Appendix C). Within these 121 items, seven validated questionnaires regarding health-related quality of life (EQ-5D-5L [148]), RTW self-efficacy [149], resilience (RSA [150]), anxiety (GAD-7 [151]), depression (PHQ-9 [152]), sleep (ISI [153]), and alcohol use (CAGE [154]) were included. Three single items regarding fatigue [155, 156] work ability [157] and pain intensity [158, 159] were taken from validated questionnaires. The remaining items were unvalidated single-items, querying the participants about sociodemographic-, work- and personal factors.

### **2.6.2.1. Variable selection process**

The questionnaire package contained several questions not used in the papers in this thesis. Choice of variables to include was decided by the specific aim of each paper based on available empirical evidence.

For Paper 2, a literature search for reviews on prognostic factors for RTW and factors found to be predictive of RTW was performed. This literature search resulted in an initial list of 32 reviews and 42 potential variables (see Appendix D). This list was the starting point for a group discussion involving all authors. After the group discussion, the list was then shortened to a suggestion of ten prognostic factors, and four sociodemographic covariates. These suggestions was sent to three co-authors, and through discussions weight was put on studies including musculoskeletal and common mental disorders. The list was shortened to the seven prognostic factors and four covariates used in the LCA model (fatigue,

psychosocial work environment, and work autonomy was not included from the previous step).

For Paper 3, a similar approach was undertaken. An examination of studies investigating part-time sick leave was undertaken. All variables that were consistently identified to differ between those on part-time and full-time sick leave was suggested to all co-authors as covariates. Furthermore, variables with inconsistent evidence (health, previous sick leave), prognostic factors for RTW (workplace adjustment, psychosocial work environment, work autonomy, coping with work demands, work ability, and RTW motivation), and psychological resilience was suggested to all co-authors as potential factors that could influence selection. Resilience was included as a suggestion due to its potential to explain differences for individual personal and social resources. After discussions with co-authors, mostly regarding interpretability and causality in a cross-sectional paper, work ability and RTW motivation were not included. All other suggestions were included.

Table 2 contains an overview of used instruments and variables used in Paper 2 and Paper 3. These will be explained in detail below.

#### 2.6.2.2. Sociodemographic variables

Questions regarding sociodemographic factors that were included in both Paper 2 and 3 were age, gender, education, and the physical demands of work. Age was scored as a continuous variable. Gender was a dichotomous question (i.e. forced choice between the two genders male/female). Education was categorical with seven categories ranging from no basic education, to having completed basic education, high school, trade school, higher education at the college university level for three, or five years, or completed Ph.D. For both papers this variable was dichotomized as higher (completed a minimum of three years of college/university), or lower education. The physical demands of work were assessed by asking participants to describe their working using the categories “Mostly sedentary work”, “Work that demand that you walk a lot”, “Work where you walk and lift a lot”, “Heavy manual labour”, and “Do not know / unsure”. For both papers the variable was dichotomized (physically demanding work or not) by combining the two less demanding categories and the two more demanding categories, and “Do not know / unsure” was set to missing. Furthermore, for Paper 3 work sector was included and dichotomized as public or private, and a response option “Do not know/unsure” was set to missing.

Table 2 – Overview of measurement instruments used in Paper 2 and Paper 3.

Variable	Scale / index	Reference	Paper 2	Paper 3
<b>Sociodemographic</b>				
Age	N/A	N/A	x	x
Gender	N/A	N/A	x	x
Education	N/A	N/A	x	x
Work sector	N/A	N/A		x
Physical demands of work	None (single item)	N/A	x	x
<b>Health-related</b>				
Diagnosis	ICPC-2	[20]	x	x
Sick leave degree	N/A	N/A		x
Self-reported health	EQ-VAS	[148]	x	x
Pain intensity	BPI (single item)	[158, 159]	x	
Anxiety and depression	PHQ-ADS	[160]	x	
Previous sick leave	None (single item)	N/A		x
<b>Personal and psychological</b>				
Work ability	WAI (single item)	[157]	x	
RTW self-efficacy	RTW-SE	[149]	x	
RTW expectations	None (single item)	N/A	x	
Psychological resilience	RSA	[150, 161]		x
<b>Work-related</b>				
Workplace adjustment latitude	None (single item)	N/A	x	x
Psychosocial work environment	None (single item)	N/A		x
Work autonomy	None (single item)	N/A		x
Coping with work demands	None (single item)	N/A		x

*Measurement instruments, data sources and references of variables included in Paper 2 and Paper 3. RTW: Return to work. ICPC-2: International Classification of Primary Care second edition. EQ-VAS: EuroQol visual analogue scale. BPI: Brief pain inventory. PHQ-ADS: Patient health questionnaire anxiety depression scale. WAI: Work ability index. RTW-SE: Return to work self-efficacy. RSA: Resilience scale for adults. N/A: Not available.*

### 2.6.2.3. Health-related variables

For both papers, self-reported health was assessed using the visual analogue scale (EQ-VAS) from the EQ-5D-5L questionnaire [148]. The EQ-VAS rates self-reported health on a scale from 0-100. While the EQ-VAS originally was intended as a paper-based measure (its name states an analogue scale), its equivalence on screens have been demonstrated [162]. It is difficult to know what a self-reported health measure contains, but such measures has been shown to be good predictors of future health [163] and is arguably an informative measure of health status [164].

In Paper 2, anxiety and depression symptoms were assessed using the Generalized Anxiety Disorder-7 (GAD-7) [151], and the Patient Health Questionnaire-9 (PHQ-9) [152],

respectively. GAD-7 and PHQ-9 uses a four-point categorical scale to assess whether individuals have experienced anxiety and depressive problems in the previous two weeks. The categories are “not at all”, “some days”, “more than half of the days”, and “almost every day”. As these two measures are highly correlated, they were combined into one composite measure of anxiety and depression. The composite measure patient health questionnaire anxiety depression scale (PHQ-ADS) has been shown to be a reliable and valid measure of anxiety and depression [160]. PHQ-ADS has also been shown to be associated with days with disability (i.e., sickness absence or reduced work activity) [165]. The sum of the seven single items in GAD-7 and the nine items of the PHQ-9 is used for the PHQ-ADS composite measure. Thus, PHQ-ADS assess anxiety and depression symptoms on a scale from 0-48, where 0 indicate low levels of symptoms and 48 indicate high levels of symptoms.

Paper 2 also included a single item from the Brief Pain Inventory [158, 159] querying participants to “Describe your average pain intensity the last week” on a scale from 0 (no pain at all) to 10 (worst possible pain). Numeric rating scales used for pain assessment, such as average pain intensity, have shown acceptable psychometric properties particularly for cross-sectional comparisons [166].

In Paper 3, a history of previous long-term sick leave was assessed by asking participants whether they, in their working life, have had a previous sick leave episode lasting more than eight weeks. This item was included in order to investigate whether recurring sick leave would be relevant for the use of part-time sick leave, as conflicting findings were reported by previous research.

#### ***2.6.2.4. Personal and psychological variables***

Paper 2 included measures of work ability, RTW self-efficacy, and RTW expectations. Work ability was assessed using the work ability score item from the Work Ability Index [157]. The work ability score asks participants about their “current work ability compared with lifetime best” on a scale from 0 (completely unable to work) to 10 (work ability at its best), and is a good alternative to using the full index [167, 168]. Return to work self-efficacy was measured with the RTW-SE scale created by Lagerveld et al. [149]. This scale contains 11 questions on expectations of working if the participants were to imagine being back to work tomorrow. The scale ranges from 0 “totally disagree to 5 “totally agree”. An average score of the 11 items was used. RTW expectations was measured by asking

“Starting today, how many months do you believe you will be sick-listed?”. Answers greater than 12 months ( $n = 14$ ) were set to 12 months, as this is the maximum length of sick leave benefits [15]. Asking sick-listed workers about their sick leave expectations has been found to be an accurate prediction tool for length of sick leave [169].

Paper 3 included a measure of psychological resilience assessed using the Resilience Scale for Adults [150, 161]. The scale consists of 33 questions assessing the individual’s social competence, social resources, planned future, family cohesion, structured style and perception of self on a range from one (low) to seven (high). The scale is a valid and reliable measurement of personal and social protective resources that contribute to healthy adjustment to stress [161].

#### **2.6.2.5. Workplace-related variables**

Both papers included a single-item measurement of workplace adjustment latitude, operationalized by the question “To what degree do you feel your workplace facilitates work adjustments?”. Response options ranged from 1 (to a very low degree) to 10 (to a very high degree). Paper 3 also included three items on psychosocial work environment, work autonomy and the ability to cope with work demands. Psychosocial work environment was examined by asking “How would you rate the psychosocial work environment at work? (1 is very bad – 10 is very good)”. Work autonomy was examined with the question “To what degree are you able to plan your own work (1 is to a very small degree and 10 is to a very large degree)”, and coping with work demands with the question “How well do you feel you cope with the demands of your work? (1 is very badly and 10 is very well)”.

#### **2.6.3. Register-data (Paper 2 and 3)**

ICPC-2 diagnosis was used in both papers 2 and 3, and was obtained from NAV from the sick listing certificate set by the individual’s GP. In both papers diagnosis was categorized as “Musculoskeletal” (ICPC-2 L), “Psychological” (ICPC-2 P), or “Other” (containing all other diagnoses). In Paper 2, the rationale was to investigate the distribution of major diagnostic categories across subgroups. In Paper 3, diagnosis was used as a covariate in order to adjust for differences in diagnosis between those on full-time and part-time sick leave.

In Paper 3, sick leave degree in percentage set by the participants' GP was used as the dependent variable to assess differences between the full-time sick listed (100% sick leave degree) and the part-time sick listed (less than 100% sick leave). This information was obtained from the sick leave certificate by NAV. The variable was dichotomized as any grading percentage meet the work activity demands [139].

## 2.7. Analyses

All three papers use descriptive analyses with three different approaches. Paper 1 had a descriptive qualitative approach in which the lived experiences as described by the participants forms the basis for analysis. Paper 2 described subgroups of individuals that shared similar characteristics. Paper 3 described differences between those on part-time and full-time sick leave. All statistical analyses were performed with Stata (15.1 and 16.1) [170, 171].

### 2.7.1. Descriptive phenomenology (Paper 1)

Interview data was analysed with Giorgi's descriptive phenomenological method [146]. Phenomenology is concerned with how the world is experienced by us as humans. Phenomenology aims to understand how the world appears to participants and how they perceive and experience the world from their perspective [141]. Thus, in phenomenology how the world is perceived vary depending on the perceiver's context and psychological attributes (e.g. desires, attitudes, emotions) [141]. Giorgi's descriptive phenomenology is inspired by the natural sciences and was developed through a desire to describe psychological phenomena in a non-reductionistic way, while still being rigorous [172]. In this study we wanted to examine the psychosocial aspects of being sick listed as experienced by the sick listed individuals. Giorgi's descriptive phenomenology was chosen as it offers a way to describe the phenomena as experienced by the participants, while attempting to limit the influence and potential interpretation of the researcher.

Researchers using this method should begin the analysis process by assuming the phenomenological attitude, in which we are not assuming one objective reality, but view the subjective descriptions from the participants as their reality [146]. Furthermore, any previous knowledge should be set aside and the descriptions from the participants should be taken as

given, also referred to as bracketing [146]. Similarly, it is also important for researchers to be aware of their position in the world, and any influence that their beliefs and assumptions may have on the whole research process (i.e., being reflexive) [141]. In this paper concepts of reflexivity, bracketing and preconceived assumptions were presented to all authors and discussed before starting analysis.

After assuming the phenomenological attitude, the steps of Giorgi's descriptive phenomenology offers a structured way to reach descriptions of the psychological phenomena in question [146]. An example of the analytic process can be found in Table 3 in Paper 1. Any such data analysis is reductionist and interpretative and will ultimately create general abstractions of the words said by the participants. However, Giorgi [172] argue that the analysis is performed with a descriptive method, which will result in a description of the phenomena that was unknown to the researchers before analysis was undertaken. The analytic steps were undertaken for all interviews by the first and second author. All other authors performed a more overarching analysis of two or more interviews. All analytical findings were discussed in group sessions. This means that all interviews were analysed by at least three authors to reduce the impact of preconceptions from a single researcher. The themes from each interview were then combined into three major themes that described the experiences for most individuals in the study.

### **2.7.2. Latent class analysis (Paper 2)**

In Paper 2 LCA was used to identify classes of sick-listed individuals based on their scoring on prognostic RTW factors. Seven prognostic RTW factors were included as indicators (anxiety and depression, pain, self-reported general health, workplace adjustment latitude, work ability, RTW self-efficacy, and RTW expectations), and four sociodemographic variables were included as covariates in the model (age, gender, education, and physical demands of work). See Figure 1 in Paper 2.

LCA attempts to identify subgroups, or classes, of individuals who share common characteristics and are as distinct as possible from the other identified subgroups [173]. LCA was chosen as it has some advantages over other subgrouping techniques. For instance, LCA can produce statistical information about model fit that can help guide model selection [174]. Furthermore, the method is flexible and can be used with different types of data, allows for different subgroup distributions (i.e., shape, size, and orientation), and handles missing values



well [174, 175]. In this paper the best model fit was pursued by testing these different subgroup distributions as recommended by Masyn [176].

In LCA one can never be certain that one has reached an optimal model (i.e. global maxima) [176]. However, in order to maximize the likelihood of arriving at an optimal model after model estimation, several random draws of starting points for the analysis can be made [176]. For this study a minimum of 200 draws for each model was made. These draws specify starting values to be computed by randomly assigning initial class probabilities [177]. In all models except one, the model reliably converged. The final model decision was made by assessing model fit by the sample-size adjusted Bayesian Information Criteria [178] and substantive interpretation of practical meaning for the subgroups. The substantive interpretation was arrived at in discussions involving all authors. After model selection, characteristics of the subgroups and distribution of diagnostic categories across the subgroups were examined using descriptive statistics.

### 2.7.3. Logistic regression (Paper 3)

Descriptive statistics were used to describe those on part-time and full-time sick leave, and logistic regression was used to investigate statistical differences between these two groups. The analysis contained a first step in which bivariate analyses between the part-time sick leave (dependent variable) and all other variables were performed. This step was performed in order to assess whether those on part-time and full-time sick leave statistically differ on each variable. In the next step a multivariate analysis was performed where each significant independent variable in the first step was adjusted for the previously known differences between the two groups. This step was performed to assess whether the groups differed on proposed new factors statistically independent of aspects that are often captured by register-data. Furthermore, bivariate and adjusted analyses including quadratic age and self-reported health-status separately were performed in order to examine their proposed curvilinear associations with part-time sick leave. F-tests were used to examine whether a model with the quadratic term significantly improved model fit. A significance level of  $\alpha = 0.05$  was used for all analyses. To infer results from missing data, multiple imputations using chained equations was utilized. Number of observations for each variable, and consequently missingness, can be found in Table 1 in the paper.

## 2.8. Ethical considerations

The project that this thesis is part of is approved by the Regional Committees for Medical and Health Research Ethics in South East Norway (No: 2016/2300). All participants were given information about the study and gave written informed consent to be included. All participants were also informed that participation in the study would not affect their follow-up from NAV and have no effect on benefits. Furthermore, participants taking part in interviews signed an extra informed consent form regarding their participation in interviews (see Appendix B). No data from this thesis can be used to identify single individuals.

### **3. Summary of results**

In this chapter, results from the three papers are summarized. More detailed results can be found in the papers included in this thesis.

#### **3.1. Paper 1 – Health, work and family strain - psychosocial experiences at the early stage of long-term sickness absence**

The sample included 13 women and 3 men, aged 32-59. Based on descriptive phenomenology, three overarching themes were identified: (1) energy depleted, (2) losing normal life, and (3) searching for a solution. The first theme recounts how participants were depleted of energy due to challenges such as health issues, and work and family strain. Sick leave was thus viewed as necessary in order to have remaining energy to function in their non-work roles. The theme losing normal life depicted how sick leave was experienced as an abnormal situation that challenged individuals' identity as hard working, contributing members of society. Furthermore, social life was disrupted as work as a social arena was lost, and expectations towards behavior when sick listed limited socializing outside of work for some. Finally, the last theme described how individuals varied in finding solutions to make progress towards RTW. Individuals received much assistance from their employer and healthcare services, however some experienced uncertainty and lacked solutions to their problems. Participants were also uncertain of their capacity when attempting RTW, and a gradual RTW plan and cooperation with their employer was considered necessary for many.

#### **3.2. Paper 2 – Subgroups of long-term sick-listed based on prognostic return to work factors across diagnoses – A cross-sectional latent class analysis**

In this study 571 participants answered the questionnaire of which 39 participants had too many missing answers to be classified by the LCA. This left 532 individuals for the study sample. The mean age of the sample was 44 years, and consisted of 65% women, and 65% had higher education. The overall symptom scores for the sample indicated mild anxiety and depressive symptoms, and mild to moderate pain intensity. Diagnoses were split by about a third for musculoskeletal (37%), psychological (32%), and all other diagnostic categories (31%).

The best model fit of the LCA was achieved with models that relaxed the assumption of local independence for those variables that were found to significantly covary within a class in the unrestricted models. Within this model configuration a five-class solution had the best model fit measured by adjusted Bayesian Information Criteria, and this model and those with  $\pm$  one class was further examined. The four-class solution was determined to be more practically recognizable and was thus selected despite the five-class model having a better statistical model fit.

Class 1 contained 45% of participants and was characterized by individuals who scored favorably on several of the prognostic RTW factors. Individuals in this class reported the highest work ability and the lowest anxiety and depressive symptoms among the classes. Furthermore, they reported the highest workplace adjustment latitude, the highest RTW self-efficacy and the shortest expected sickness absence length, at 1.8 months. Class 2 included 22% of participants and was characterized by individuals who had the highest anxiety and depressive symptoms, as well as the poorest RTW self-efficacy. This class also contained a larger proportion of those with higher education (86%), the youngest mean age at 39 years, and had the lowest frequency of physically demanding jobs (11%). They also reported the lowest pain intensity. Class 3 included 16% of participants characterized those who scored unfavorably on several prognostic factors. This class consisted of the lowest proportion with higher education (36%). Individuals in this class reported moderate anxiety and depressive symptoms as well as the highest pain intensity and had the longest self-expected absence length with almost seven months. They also had the lowest self-reported work ability. Class 4 had 17% of participants and was largely characterized by those with moderate symptom scores, but also frequently had physically demanding jobs (55%) with the lowest adjustment possibilities. The classes reported similar self-reported health. With regard to diagnosis, Class 2 had a greater prevalence of individuals with a psychological diagnosis (62%), but in the other classes diagnoses were distributed more proportionate to the sample.

### **3.3. Paper 3 – Workplace resources important for part-time sick leave selection – an exploratory cross-sectional study of long-term sick listed in Norway**

The sample included a total of 661 participants, where 394 individuals (40%) had a part-time sick leave certificate. The part-time sick leave group included more women, and more individuals with higher education and less physically demanding work, than those on

full-time sick leave. The bivariate logistic regression revealed no linear differences between these two groups for self-reported health, previous sick leave, or personal resilience. However, those on part-time sick leave significantly more often experienced greater workplace adjustment latitude (Odds Ratio (OR) 1.10, 95% Confidence Interval (CI) 1.04-1.16), more work autonomy (OR 1.07 CI 1.02-1.13), and better psychosocial work environment (OR 1.07 CI 1.01-1.14), while they experienced poorer coping with work demands (OR 0.92 CI 0.85-0.99). Furthermore, a reverse U-shaped curvilinear association between part-time sick leave and age, and between part-time sick leave and self-reported health was identified.

The covariate-adjusted analyses reveal that the differences for gender (OR 1.60 CI 1.12-2.30) and physical demands of work (OR 0.61 CI 0.42-0.89) persisted after adjusting for the other covariates. Furthermore, the adjusted analyses also reveal that workplace adjustment latitude (OR 1.10, CI 1.04-1.16), psychosocial work environment (OR 1.10 CI 1.03-1.18), and work autonomy (OR 1.06, CI 1.00-1.13) also persisted after adjusting for previously known selection factors. However, coping with work demands was no longer significant at the 95% level (CI 0.87-1.02). The curvilinear association for age was no longer significant at for the adjusted analyses, while the curvilinear association between part-time sick leave and self-reported health was largely unchanged after adjustment (see Figure 1 and 2 in the paper).

## 4. Discussion

This thesis aimed to describe the early stage of long-term sick leave in order to inform cross-diagnostic early sick leave follow-up and RTW interventions. More specifically the thesis describes commonalities across diagnoses among sick-listed workers sick-listed for eight weeks, with a sick leave degree of 50-100%. In this chapter, the findings will be discussed within a biopsychosocial framework and with regards to previous empirical findings. The results will also be examined in relation to the socio-legal context the study is embedded in and current RTW practice in Norway. Finally, strengths, limitations and suggestions for further research is discussed.

### 4.1. Discussion of findings – descriptions of the early stage of long-term sick leave

The findings from this thesis indicate that in the early stage of long-term sick leave, sick leave can for many be described as a situation involving multiple simultaneous challenges. In line with biopsychosocial theory of work disability, aspects of health, the workplace, the individual and the social environment influenced work disability. The studies revealed that individuals varied in their self-reported RTW prognosis and possibilities for graded work participation. Some experienced solutions from healthcare services and accommodating employers. Others experienced more uncertainty in their situation and consequently were more uncertain of their RTW prospects. Common subgroups of those with poorer scores on prognostic RTW factors were mental health problems and poor RTW self-efficacy, multiple health-related challenges, or challenges related to lack of workplace accommodations. Below the findings will be discussed in more detail.

#### 4.1.1. Health condition (health and symptoms)

It is important to understand why some individuals with severe health problems continue to work, while others with relatively mild impairments become disabled [41]. The findings in the papers suggested that health status on its own does not fully explain work disability in the early stage of long-term sick leave. Self-reported health was evenly distributed across the prognostic subgroups, and interactions between health, family life, and facilitators and barriers at the workplace influenced the experience and degree of work disability. Health is not deterministically tied to sickness absence [13], and psychosocial- and

work-related factors might be better predictors for RTW than health factors or symptom severity [179-181]. However, several systematic reviews also point to symptom severity as important prognostic factors for RTW possibly demonstrating the overall importance of health on RTW [65, 81, 182]. Differences in symptoms scores was also found for the prognostic subgroups in Paper 2. Furthermore, if those with the best health are close to RTW and skip part-time sick leave altogether for this reason as previously hypothesized [183], there may be a clearer association between health and work participation also in Paper 3. Overall, findings in this thesis and previous research indicate that while health is important for work disability, work participation and self-reported RTW prognosis also depend on the interaction between health and other factors in the early stage of long-term sick leave.

#### **4.1.2. Personal factors (perceptions and beliefs)**

Individuals have personal facilitators and barriers affecting their ability to work, which may be known only to those experiencing them [184]. How individuals respond to their poor health has been proposed to impact how poor health influence work disability and RTW [185]. The findings in this thesis suggest that individuals vary in their RTW self-efficacy, and level of uncertainty with regards to own health and coping with work demands. Beliefs about health and confidence in ability (i.e., self-efficacy) to manage work demands upon RTW is important for RTW across health problems [69, 79, 80, 182]. These beliefs and perceptions influence an individual's behavior in decisions to expand effort in an attempt to RTW and can also predict time to RTW [186]. Returning to the workplace prior to full recovery has previously been describes as a key characteristic of RTW [187]. Thus, changing an individual's mindset regarding RTW could improve work outcomes. This is demonstrated by the efficacy of work-directed cognitive therapies focusing on improving self-efficacy combined with a gradual RTW for patients with mental health disorders [188]. Cognitive behavioral therapies might also be effective for musculoskeletal patients with mental distress and fear-avoidance or catastrophizing thoughts [189, 190]. The detrimental effects of personal factors have been hypothesized to increase as temporal distance from work increases [56]. However, such aspects were also relevant for many participants in this thesis. These individuals could possibly benefit from early interventions aiming to change beliefs and perceptions that are detrimental for RTW.

### 4.1.3. Environmental factors

#### 4.1.3.1. *The social context*

Social aspects have received less attention than other domains as prognostic factors for RTW. Even less is known about how social factors might facilitate or hinder RTW in the early stage of sick leave. The findings in this thesis suggest that the interactions between health, work and family demands should be taken into account in early RTW follow-up. How families can influence RTW outcomes has little research evidence, but marital status (i.e., being divorced or a lone parent) [56, 78] and having care responsibilities for children may be predictors of prolonged sick leave [78]. However, beside RTW much research has been undertaken to investigate work-family conflict, in which the work domain interferes with the family domain and vice versa. Findings from this field of research suggests that while social support outside of work is important to reduce this conflict, support received from work is more effective in reducing both work interfering with family, and family interfering with work type conflicts [191].

In Norway, poor health as a consequence of care responsibilities are legible reasons for sickness absence, while care responsibilities on their own are not [53]. This ambiguous distinction was exemplified in Paper 1. Eligibility for benefits consists of a difficult trade-off between an inclusive welfare system and self-sufficiency for the individual. Generous and accessible sickness benefit schemes has been pointed to as one of the main reasons for high sick leave in Norway [192]. For some, a generous welfare system could play into fears and avoidant behavior and prolong sick leave [19], while for others it can provide a sense of security promoting health and well-being [193], which could allow an increased focus on RTW. Although there is a risk of individuals taking advantage of a generous system, researchers have suggested that the losses from prolonged absence (e.g. socially, financially and psychologically) might be more powerful factors than the potential gains [41, 194].

The trade-off between gains and losses were also exemplified by experiences in Paper 1 where sickness absence was experienced as a necessary but undesirable situation that challenged the participants' social life and identity as contributing members of society. Work is an important element in defining oneself [185], and illness may lead to loss of self-image, social isolation and prevent activities that would otherwise be normal [195]. The findings suggest that societal expectations of illness behavior may in some cases still be similar to the Parsonian sick role [33] and lead to social isolation which can prolong sick leave [196]. Part-time sick leave was experienced as useful in order to be able to focus on recovery, maintain a



life outside of work, and to restore some of the normality that comes with work participation. The findings suggest that RTW professionals may have an important role in the early stage of long-term sick leave by promoting behaviours that facilitate RTW and deter withdrawal behaviours that create further social isolation. In a recent study from the same sample as this thesis sick-listed workers were met by caseworkers trained in motivational interviewing [197]. Motivational interviewing is a client-centered and directive counselling method aimed to facilitate behavioural change [198]. One finding from this study was that the sick-listed experienced normalizing of their situation and caseworkers legitimized their absence which helped reduce the experience of stigma and guilt [197].

#### *4.1.3.2. The work context*

The importance of the workplace and employer has been extensively documented in vocational rehabilitation. Several effective RTW interventions focus on the workplace [89, 97], including early interventions [111]. Effective therapeutic interventions also often include a work-focus [90, 188]. The results from this thesis consistently indicate that work flexibility was an important aspect for RTW beliefs and work participation in the early stage of long-term sick leave. The importance of workplace resources was also largely independent of diagnosis and the physical demands of work. Paper 2 also highlight that prognostic subgroups differ in these regards, where the subgroup with advantageous scores on several prognostic RTW factors also report more adjustment possibilities. Previous research has shown that workplace flexibility can help reduce the consequences of high job demands when returning to work [199]. Having an emphatic, problem solving, and interacting supervisor has been shown to be valued to sick-listed workers [200] and support from the employer or supervisor has shown to be important for sustainable RTW [79]. Thus, psychosocial aspects of work need to be considered when designing interventions [201]. The findings in this thesis also describe the perceived benefits of workplace flexibility, supervisor support, and a good psychosocial work environment. These aspects may not be equally available to all sick-listed workers and are thus important factors to identify in the early stage of long-term sick leave, independent of diagnosis.

#### 4.1.4. The dynamic interrelations of work disability in the early stage of long-term sick leave

The overall RTW literature converges on a multi-domain biopsychosocial relationship between health and work disability. Influencing this relationship are individual beliefs, attitudes and resources, characteristics of the workplace and job, and the social context surrounding the worker. There is growing evidence that the principles that prevent sickness absence and promote RTW are applicable regardless of cause [104]. This thesis underpins a similar understanding also at an early stage of long-term sick leave. As shown, the domains that influence work disability in the early stage of long-term sick leave are also dynamic, interrelated and influence each other. Work disability as conceptualized as an interaction between health, capabilities, and work demands, also influenced by contextual factors (e.g. as defined by the ICF model [11]) corresponds with the results in this thesis also in the early stage of long-term sick leave.

## 4.2. Discussion of practical implications

The aim of this thesis was to provide descriptions of early long-term sickness absence in order to inform early cross-diagnostic interventions and sick leave follow-up. To suggest direct practical implications based on the research in this thesis is premature, but the results here combined with what is previously known, present many avenues for further research.

### 4.2.1. Current practice for early return to work follow-up in Norway

The findings in this thesis largely describe cross-diagnostic aspects that match recommendations emphasizing the importance of work modification and informal support to keep individuals at work despite ill health [202]. As well as early examination of challenges and opportunities combined with a gradual work resumption to promote RTW [202]. In Norway, structures are arguably in place for an early RTW approach that follow these recommendations. First, the GP is required to assess work capabilities and whether part-time sick leave is possible [53]. Secondly, the employer has a responsibility to adjust work as far as reasonably possible, and the employee has an obligation to take part in work activities [140]. Third, a meeting between the employer and the sick-listed employee is recommended and an RTW plan is mandatory within four weeks of absence [138]. Finally, work activities (e.g. gradual work resumption) are demanded within eight weeks [53].

Previous research has indicated that sick-listed workers and employers in general regard these structures as useful (e.g. RTW plans and meetings) [203]. They promote contact between the stakeholders, clarify expectations and facilitate predictability in RTW [203]. However, in many cases the structures are insufficient to promote RTW in themselves [203]. For instance, the RTW plans often do not work as intended (e.g. little focus on the content, or using the plan as documentation of what has been attempted) [203]. Furthermore, work activities are demanded after eight weeks of sick leave. If this is not possible, either the employer needs to document why, or an expanded sickness certificate explaining medical reasons why this is not possible is required [53]. Previous findings indicate that notice of temporary stop in sickness benefits due to lack of work activities almost always lead to more medical information [203]. However, as shown in this thesis there may be selection into part-time sick leave influenced by the possibilities for work adjustment, psychosocial work environment, and work autonomy, rather than health.

The questions then arise, do these structures work as intended? If not, can the specific circumstances where these structures are inadequate be identified in order to facilitate additional support? That is, early identification of those who need but do not receive sufficient assistance, or those who receive assistance that is not beneficial for RTW? Further research can answer these questions.

#### **4.2.2. Early identification and stratified RTW follow-up**

As shown by the three papers in this thesis, individuals vary in their self-reported RTW prognosis and possibilities for work participation, and thus possibly also their need for additional RTW follow-up or interventions at this stage of sick leave. As demonstrated by previous research on musculoskeletal patients, early identification based on prognostic risk factors can be beneficial [123]. Findings in Paper 2 suggests that comparable subgroups can also be found independent of diagnosis, even though their predictive validity has not yet been determined. With a stratified approach, resources can be spent for those who are in the greatest need. Identification of those with a poor RTW prognosis is not new in the field of vocational rehabilitation and many decision support tools exist [117]. However, identification of individuals based on RTW prognosis independently of diagnosis is largely non-existent. Identifying those at risk for prolonged sick leave independent of diagnosis may have advantages for those working with diagnostically heterogeneous user-groups such as GPs,

social insurance caseworkers and RTW coordinators. Subgroups based on prognostic risk such as those identified in Paper 2 may not tell us how to intervene but could identify where attempts can be made. Furthermore, simply knowing who is at risk of prolonged sick leave is useful to create plans for RTW [58]. Thus, the potential for early identification of those at risk of prolonged sick leave, and interventions targeted at these specific risk groups regardless of diagnosis should be further investigated.

#### 4.2.3. Stakeholder involvement

In Norway the main responsibility of assisting RTW in the early stages of sick leave lies with the employer. However, given the system of social insurance paid sick leave after 16 days the employer may lack incentives to fully take this responsibility. Furthermore, assistance from employers is unequally provided based on employee value to the employer [204]. Those workers who do not find solutions to their problems may need additional early assistance. If the employer is not sufficiently incentivized to provide this extra assistance, and healthcare treatment has little impact on work outcomes, there may not be a stakeholder focusing on RTW at this early stage of sick leave. Comparisons between different legislations have proposed that the lack of employer incentives and little focus on early identification of problems in Norway may contribute to the high sickness absence rates [192].

Arguably, NAV could be in a position to provide additional case-management for those who are lacking solutions or RTW support at this stage. The intersection between the sick listed and caseworkers is important in RTW follow-up in NAV [205], and the agency prioritizes counseling methods such as motivational interviewing [206]. NAV involvement can be effective as existing dialogue-meetings between social insurance caseworkers, sick-listed workers and other stakeholders at 26 weeks of sick leave have been shown cost-beneficial for RTW [207]. For those who are not in work activities by the eight week of sick leave, there are also indications that a systematic review of possibilities and barriers to RTW by NAV caseworkers lead to improved knowledge of the sick-listed's situation and consequently improved RTW rates in the following months [208]. As shown in Paper 1, sick listed individuals also expect some form of contact with NAV in the early stages of long-term sick leave. Further research should thus investigate the potential (and cost-benefit) for NAV caseworkers to identify and provide additional assistance to those with poor prognosis and lack solutions towards RTW at this stage.

### 4.3. Methodological considerations – strengths and limitations

All quantitative research has risk of bias [209], while qualitative research run the risk of not being trustworthy [210]. Bias, or systematic error, cause observed measurements to differ from their true values and it is important to understand and, where possible, limit the impact that potential bias may have on the conclusions made [209]. In the following section the strengths and limitations of the research in this thesis will be discussed.

#### 4.3.1. Study design

A strength of the papers in this thesis is researcher triangulation, as researchers from several fields have been involved in all aspects of the design, data-collection, analysis and writing of the research results. Transparency in design, feedback from peers and researcher triangulation is important to reduce bias [211]. Furthermore, the interview guide and variables used were based on previous research. All three papers in this thesis are exploratory in which descriptions were sought, which may limit the potential of bias in the analysis phase. However, Paper 2 and 3, are both secondary analyses of a cohort recruited into a randomized controlled trial, and thus the overall research project was not designed specifically to answer the aims of these papers.

##### 4.3.1.1. *Qualitative paper*

In Paper 1, the design for the study and the interview guide was made prior to recruitment into the randomized controlled trial. One limitation of the interview guide could be the limited focus on health-related experiences which may vary across disorders. However, the first question allowed the participants to describe their situation freely, where health-related concerns were sometimes talked about. Furthermore, the focus of the paper was on the psychosocial aspects of long-term sick leave in a cross-diagnostic sample, and thus health issues was determined to be of secondary interest. Coherence between the research aim, the analysis method and the data obtained is important for rigorous qualitative research [212]. Furthermore, a sufficient sample size that demonstrates replication of categories and saturation is important to determine completeness of the phenomenon [212]. In this study, saturation was determined to be achieved when no thematically new

information was obtained. However, a potential limitation of this paper is the use of a convenience sample, and a more purposive sample could have produced different results.

#### **4.3.1.2. Quantitative papers**

The quantitative papers in this thesis (papers 2 and 3) used a comprehensive list of relevant variables that covered important sociodemographic factors, prognostic RTW factors and factors associated with part-time sick leave, selected on empirical grounds. In addition, we retained all continuous variables on their original scale, which may improve predictive power compared to categorizing [213]. Furthermore, the variable selection process included discussions between several researchers.

The variable selection process in Paper 2 rely on a literature review of systematic reviews. Systematic reviews are inherently a filtration of the results in original research [214]. Using systematic reviews may make prognostic factors that are identified in specific settings in the original research seem applicable for other settings (e.g. patient groups, sociodemographic groups, legislative systems). Furthermore, any systematic review is prone to be outdated as evidence is constantly updating [215]. However, when deciding on prognostic factors we examined the patient population of the reviews and focused on musculoskeletal and common mental disorders. In addition, several of the systematic reviews used are fairly recent, indicating an updated evidence-base. However, there is some overlap in studies included in the reviews. For instance, reviews of reviews by Gragnano et al. [82] and Cancelliere et al. [81], both include reviews by Cornelius et al. [216] and Lagerveld et al. [217], which again both include Nieuwenhuijsen et al. [218]. Reviews by Nigatu et al. [69], de Wit et al. [84], and Black et al. [80] also contain some overlap. This might lead to more weight being given to factors included in overlapping studies when decisions on prognostic factors were made. These aspects taken into mind systematic reviews are, when performed correctly, appropriate tools to examine the underlying evidence [219]. Systematic reviews reduce bias by using replicable, scientific and transparent methods, and are ideal to inform researchers and other stakeholders of current evidence of a topic [214].

#### **4.3.2. Internal and external validity**

Validity refers to whether a concept corresponds to what it attempts to describe in the real world and can be influenced by all stages of the research process [211, 220]. Distinctions

can be made between internal validity and external validity. Internal validity refers to whether the results are representative of true associations in the study population [221]. The main threats to internal validity are confounding, selection bias, and information bias [220]. External validity refers to whether conclusions can be applied to different populations and settings [221].

#### **4.3.2.1. Selection bias**

One major threat to the internal validity in the present thesis is the potential for selection bias due to a low recruitment rate of participants. Selection bias occurs when participants and non-participants in a study differ on important characteristics [220]. In order to limit the potential for selection bias, all potential participants in the target population were invited to participate, and a NAV project employee reminded and informed non-responders. However, the preferences of the participants (self-selection) determined whether they participated, and only 15% of those asked accepted the invitation. It is not possible at this time to account for the study characteristics of non-participants, but it may be prudent to assume that individuals accepting invitation may have more resources than non-participants. Descriptive information in Paper 3 indicate a sample that is highly educated, with 64% having a higher degree, as compared to 47-49% in the geographical areas of recruitment [222]. However, among the participants, the response ratio for the questionnaires was acceptable, with 81% for Paper 2 and 78% for Paper 3, indicating less risk of further bias due to non-response of the questionnaire.

#### **4.3.2.2. Confounding**

Confounding refers to the problem where an outcome and an exposure are both explained by a common cause [223]. In the papers causal explanations were not attempted but there is a risk of unmeasured confounding (i.e. omitted variable bias), in which validity is threatened by the non-inclusion of important variables. In Paper 2, the class prevalence and structures could be altered by inclusion of other variables. In Paper 3, the use of part-time sick leave may, for instance, be influenced by the GP's certification practices which has previously been shown to influence degree and length of sick leave [224].

#### **4.3.2.3. Information bias (measurement error)**

Information bias occurs because measurements used to capture phenomena are never perfect. The ways we measure concepts are influenced by the instruments used, the participants, and the researchers themselves, and may contribute to more or less accurate reflections of the actual real-world concepts. Most data in this thesis was collected by self-report which may increase the risk of measurement error for instance through social desirability bias [225]. To limit the impact of information bias we assured all participants of anonymity and that participation in the project would not affect their benefits in any way. The use of register-based data for part-time sick leave in Paper 3 and for diagnosis in both Papers 2 and 3 can be considered strengths as these data sources are less susceptible to measurement error [226, 227].

#### **4.3.2.4. External validity (generalizability)**

External validity refers to whether conclusions from a study can be applied outside the context of that study [221]. In this case, whether the results in these studies can be generalized to other populations of early long-term sick listed. A threat to external validity is sampling bias in which the sample may not be representative of long-term sick listed in the population. Thus, generalizing the sample to other populations nationally or internationally may also be threatened by characteristics of the study population. For instance, the geographical area of recruitment is more highly educated than the national average in Norway (34.6% higher education) [228], and may not be representative of long-term sick listed. Furthermore, the socio-legal context in Norway may preclude generalizing the results to other settings with different sickness benefits and legislative systems.

#### **4.3.2.5. Rigor in qualitative research**

Validity and reliability in qualitative research can be enhanced through self-correcting verification strategies in the research process [212] as well as through transparent reporting [143]. Including other researcher in the research process can promote validity by providing checks and verification of the analysis [143, 229]. In Paper 1 researcher triangulation was used at all stages of design, data-collection, analysis and writing of the paper. Guidelines of quality in qualitative research also emphasize transparency, which can be heightened by reporting participant characteristics, the context of the sample, the analysis process, as well as



demonstrating the analytic categories in examples [143]. These aspects were reported in the study. An aspect of good practice that received less attention in the paper was transparency in researchers perspectives and backgrounds, i.e., the role of reflexivity [141, 143]. Reflexivity received attention in the analytic process in the paper, but the positions of the researchers were largely hidden from the reader. Inclusion of systematic presentation of analyses and reflexivity issues are recommended as alternative interpretation of data are always possible [141].

In qualitative research, rather than external validity, transferability refers to the ability to transfer experiences and results to situation with similar characteristics [229]. Transferability can be heightened by rich descriptions of the data which allow the reader to determine whether the results speak to their situation [229]. Furthermore, the context of the study should be explicitly reported [143]. In Paper 1, we included several quotations from participants to illustrate each theme and provide rich descriptions of the experiences.

Qualitative research usually is less concerned with reliability as the goal is to explore unique experiences in detail [141]. However, some argue that the same data analyzed with similar methods should yield similar results independent of researchers [141]. Thus, researcher triangulation can also increase reliability by identifying whether different perspectives converge on similar interpretations [141].

#### **4.3.3. Measurement instruments and data collection**

The papers in this thesis used several validated questionnaires. The use of these instruments can be considered a strength as they have established psychometric properties and have been used previously in sick leave research which demonstrate theoretical and empirical support for their construct validity. However, these scales were translated into Norwegian, and for the RTW self-efficacy scale no validated translation exists. Furthermore, several variables used in the papers were also single-item variables that have not demonstrated validity or reliability, which limits the confidence in and interpretability of these results.

#### **4.3.3.1. Missing data**

Most data collection sources are bound to have missing data, not least self-report. Missing data was also present in the papers in this thesis. Two different strategies for missing data were employed, with expectation maximization for the LCA in Paper 2, and multiple imputation using chained equations in Paper 3. Methods for handling missing data may have benefits, such as an increased usage of the data sets and increased analytical power [230]. But they also can produce bias and should be used with caution, especially when the values are not missing at random which were the case in the papers included as we set “Do not know” answers for two variables to missing. However, the trade-off between bias due to excluding non-complete cases, and bias due to inferring results from non-random missing data is difficult to determine, and the concern should be assessed by the researchers [230]. Thus, we assumed that the potential benefit of imputation was greater than the risk bias by imputing these variables. The results should nonetheless be interpreted with caution.

#### **4.3.3.2. Measuring psychological constructs**

A methodological problem is also the potential overlap in psychological constructs that attempt to measure behavior or behavioral intent. In the RTW literature, several constructs exist that measure beliefs in own current and future work capacity, such as work ability, RTW self-efficacy and RTW expectations. These constructs, which were included in Paper 2, may measure similar theoretical concepts and lack discriminate validity. For instance, RTW self-efficacy is similar to RTW expectations [88]. However, as shown in a sample sick-listed due to common mental disorders, the constructs differ in their predictive validity of actual RTW [231] and may thus measure different aspects of similar constructs.

#### **4.3.4. Reliability and replication**

As we have seen, there are some factors that cause uncertainty regarding the validity of the results in this thesis, and the findings should be replicated in order to determine the reliability of the results. Several different perspectives are needed in order to synthesize qualitative findings to be used for informing practice [124]. Thus, Paper 1 needs conceptual replication in other samples in order to examine whether similar or different experiences can be identified. For instance, in samples including more lower educated workers, and more men.

Paper 2 identified prognostic subgroups independent of diagnosis that were comparable to previous diagnosis-specific findings. However, the subgroups need to be replicated in representative samples. Furthermore, additional research should also be performed with additional or different prognostic variables to examine if the class structure and prevalence is significantly altered. Although the findings in the paper suggest that it is possible to identify distinct subgroups based on prognostic RTW factors, more research is needed to assess the predictive validity of the subgroups. In addition, identifying prognostic subgroups that may be at risk of prolonged sick leave is not the same as identifying subgroups that can be intervened on [232]. Prognostic stratification through latent classes could be used to identify those at greatest risk, but the usefulness depends on the intervention efficacy for that subgroup.

Paper 3 also needs to be replicated with validated questionnaires in a representative population sample of sick-listed workers. Furthermore, in this paper we only included participants with a sick-listing degree of 50-100% and a sick leave length of eight weeks, which may limit the conclusions that can be drawn. However, population data has revealed that the use of part-time sick leave in Norway peaks at around 6-8 weeks of sick leave just before the activation requirements [85]. Part-time sick leave may be less relevant for shorter sick leave spells than long-term sick leave as non-infectious diseases that arguably rarely completely eliminates work ability are common for longer sick leaves. Furthermore, relatively few have sick listing degrees below 50% at this stage of sick leave [85]. Thus, eight weeks may be a sensible time to investigate differences in part-time and full-time sick leave. Nonetheless, further research could also examine shorter sick-leave and lower part-time certificates for selection.

## 5. Conclusions

Findings in this thesis suggests that several principles that guide work disability prevention, such as a biopsychosocial orientation, workplace flexibility and graded RTW, are important to consider in the early stage of long-term sick leave independent of diagnosis. The findings also suggest that individuals differ in their need for additional assistance. Current practice of RTW follow-up in Norway capture many aspects identified in this thesis, such as early identification of work capabilities, obligations to adjust work, and requirements of work activity (e.g. graded work resumption). However, these structures may not be sufficient to identify and help those with low work flexibility, or with barriers to RTW in the non-work domains. Thus, a stratified approach with early identification of those at greatest risk of prolonged sick leave could be a sensible way forward. Such an approach can enable allocation of resources based on need and potential barriers to RTW. Based on the findings in this thesis, a stratified approach should not only focus on the worker's health but have a biopsychosocial orientation that also include beliefs and perceptions, and the social context surrounding the worker. Furthermore, workplace resources were important at this stage of sick leave but were unequally available to sick-listed workers, and this should be considered when designing early RTW follow-up. However, for the findings in this thesis, replication is needed to ensure that the experiences and results found are valid, reliable, applicable in other settings, and can be appropriately used to inform early cross-diagnostic RTW follow-up.

To summarize, this thesis suggests that in the early stage of long-term sick leave, across diagnostic categories:

- Sick leave is experienced as necessary to have a functioning life outside of work while recovering from poor health and other simultaneous challenges.
- Sick leave disrupts experiencing a normal social life, through removing work as a social arena, and restricting behaviors outside of work.
- Sick-listed workers can be grouped into distinct and practically recognizable subgroups based on prognostic RTW factors independent of diagnosis.
- Individuals differ in their need for RTW follow-up and have distinct challenges.
- Part-time sick leave can be a strategy to normalize the sick-listed worker's social situation and to manage uncertainty regarding work demands upon RTW.

- Part-time sick leave may be unequally available for sick listed workers, as those on part-time sick leave report greater workplace flexibility than those full-time sick listed.

These findings have the following implications:

- Stratification approaches should be investigated where those at greatest risk of prolonged sick leave are identified and provided additional early RTW follow-up based on risk characteristics.
- The structures that exist in Norway for early RTW follow-up are arguably in accordance with the findings and previous recommendations, but situations where they are insufficient should be identified and further examined.

## 6. References

1. United Nations. Universal Declaration of Human Rights. Art 23. 1948.
2. Waddell G, Burton AK. Is work good for your health and wellbeing? London, UK: The Stationery Office; 2006.
3. Modini M, Joyce S, Mykletun A, Christensen H, Bryant RA, Mitchell PB, Harvey SB. The mental health benefits of employment: Results of a systematic meta-review. *Australas. Psychiatry*, 2016;24(4):331-336. doi: 10.1177/1039856215618523.
4. van der Noordt M, IJzelenberg H, Droomers M, Proper KI. Health effects of employment: a systematic review of prospective studies. *Occup Environ Med*. 2014;71(10):730-6. doi: 10.1136/oemed-2013-101891.
5. The Norwegian Government. IA-avtalen 2019-2022. 2018. Available from: [https://www.regjeringen.no/no/tema/arbeidsliv/arbeidsmiljo-og-sikkerhet/inkluderende\\_arbeidsliv/ia-avtalen-20192022/ia-avtalen-20192022/id2623741/](https://www.regjeringen.no/no/tema/arbeidsliv/arbeidsmiljo-og-sikkerhet/inkluderende_arbeidsliv/ia-avtalen-20192022/ia-avtalen-20192022/id2623741/) Accessed 02.10.2020.
6. OECD. Employment rates. In *OECD Factbook 2013: Economic, Environmental and Social Statistics*. Paris: OECD Publishing; 2013. doi:10.1787/factbook-2013-51-en.
7. OECD. *Sickness, Disability and Work: Breaking the Barriers: A Synthesis of Findings across OECD Countries*. Paris: OECD Publishing; 2010. doi: 10.1787/9789264088856-en.
8. Dahl ES, Lien OC. NAV-ytelsene frem mot 2060. En oppdatering. NAV-Notat nr 2 – 2019. Oslo: The Directorate of Labour and Welfare; 2019. Available from: <https://www.nav.no/no/nav-og-samfunn/kunnskap/analyser-fra-nav/notatserie/nav-ytelsene-frem-mot-2060.en-oppdatering>. Accessed: 02.10.2020.
9. Norwegian Labour and Welfare Administration. Utbetalinger til personer i Norge per fylke og kommune. 2020. Available from: <https://www.nav.no/no/nav-og-samfunn/statistikk/flere-statistikkomrader/utbetalinger-til-personer-i-norge-per-fylke-og-kommune>. Accessed 02.10.2020.
10. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *Spine J*. 2008;8(1):8-20. doi: 10.1016/j.spinee.2007.10.005.
11. World Health Organization. *International Classification of Functioning, Disability, and Health: ICF*. Geneva: World Health Organization; 2001.
12. Stucki G, Brage S, Homa D, Escorpizo R. Conceptual framework: disability evaluation and vocational rehabilitation. In Escorpizo R, Brage S, Homa D, Stucki G. (eds) *Handbook of vocational rehabilitation and disability evaluation*. Cham, CH: Springer; 2015 (pp. 3-10). doi: 10.1007/978-3-319-08825-9\_1
13. Markussen S, Røed K, Røgeberg OJ, Gaure S. The anatomy of absenteeism. *J. Health Econ*. 2011;30(2):277-92. doi: 10.1016/j.jhealeco.2010.12.003
14. Gabbay M, Taylor L, Sheppard L, Hillage J, Bamba C, Ford F, Preece R, Taske N, Kelly MP. NICE guidance on long-term sickness and incapacity. *Br. J. Gen. Pract*. 2011;61(584):e118-24. doi: 10.3399/bjgp11X561221
15. Folketrygdloven. National Insurance Act. 1997. Available from: <https://lovdata.no/dokument/NL/lov/1997-02-28-19>. Accessed 02.10.2020.
16. Escorpizo R, Finger ME, Reneman MF. Integration and application of the International Classification of Functioning, Disability and Health (ICF) in return to work. In Schultz I, Gatchel R (eds) *Handbook of Return to Work*. Boston, MA: Springer; 2016 (pp. 99-118). doi: 10.1007/978-1-4899-7627-7\_6

17. Vingård E, Alexanderson K, Norlund A. Chapter 9. Consequences of being on sick leave. *Scand. J. Public Health*. 2004;32(63\_suppl):207-15. doi: 10.1080/14034950410021899
18. Statistics Norway. Sykefravær. 2020. Available from: <https://www.ssb.no/arbeid-og-lonn/statistikker/sykefratot>. Accessed: 02.10.2020.
19. OECD. Mental Health and Work: Norway. In *Mental Health and Work*. Paris: OECD Publishing; 2013. doi: 10.1787/9789264178984-en
20. World Organization of Family Doctors. ICPC-2. International Classification of Primary Care. Oxford, UK: Oxford University Press; 1998.
21. Norwegian Labour and Welfare Administration. Legemeldt sykefravær etter diagnose. 2020. Available from: <https://www.nav.no/no/nav-og-samfunn/statistikk/sykefravar-statistikk/sykefravar>. Accessed 02.10.2020.
22. Knudsen AK, Allebeck P, Tollånes MC, Skogen JC, Iburg KM, McGrath JJ, Juel K, Agardh EE, Årnlöv J, Bjørge T, Carrero JJ. Life expectancy and disease burden in the Nordic countries: results from the Global Burden of Diseases, Injuries, and Risk Factors Study 2017. *Lancet Public Health*. 2019;4(12):e658-69. doi: 10.1016/S2468-2667(19)30224-5
23. Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388(10053):1545-602. doi: 10.1016/S0140-6736(16)31678-6
24. Reneflot A, Aarø LE, Aase H, Reichborn-Kjennerud T, Tambs K, Øverland S. *Psykisk helse i Norge*. Oslo: Norwegian Institute of public health. 2018.
25. Kinge JM, Knudsen AK, Skirbekk V, Vollset SE. Musculoskeletal disorders in Norway: prevalence of chronicity and use of primary and specialist health care services. *BMC Musculoskelet. Disord*. 2015;16(1):75. doi: 10.1186/s12891-015-0536-z
26. Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet*. 2012;380(9836):37-43. doi: 10.1016/S0140-6736(12)60240-2
27. Lloyd C, Waghorn G, McHugh C. Musculoskeletal disorders and comorbid depression: implications for practice. *Aust Occup Ther J*. 2008;55(1):23-9. doi: 10.1111/j.1440-1630.2006.00624.x.
28. Sissons P, Barnes H, Stevens H. *Routes onto Employment and Support Allowance*. Sheffield, UK: Department for Work and Pensions; 2011.
29. Escorpizo R, Finger ME, Glassel A, Cieza A. An international expert survey on functioning in vocational rehabilitation using the International Classification of Functioning, Disability and Health. *J Occup Rehabil*. 2011;21(2):147-55. doi: 10.1007/s10926-010-9276-y.
30. Larson JS. The conceptualization of health. *Med. Care Res. Rev*. 1999;56(2):123-36. doi: 10.1177/107755879905600201
31. Wade DT, Halligan PW. Do biomedical models of illness make for good healthcare systems? *BMJ*. 2004;329(7479):1398-401. doi: 10.1136/bmj.329.7479.1398
32. Costa-Black KM, Feuerstein M, Loisel P. Work disability models: past and present. In Loisel P, Anema J (eds) *Handbook of work disability*. New York, NY: Springer. 2013 (pp. 71-93). doi: 10.1007/978-1-4614-6214-9\_6

33. Parsons T. Chapter X. Social structure and dynamic process: The case of modern medical practice. In *The social system*. 2nd ed. London: Routledge; 1991 (pp. 428-479).
34. World Health Organization. Constitution of the World Health Organization. Basic Document 45th Ed Supplement. 2006. Available from: [http://www.who.int/governance/eb/who\\_constitution\\_en.pdf](http://www.who.int/governance/eb/who_constitution_en.pdf). Accessed 02.10.2020
35. The Lancet. What is health? The ability to adapt. *Lancet*. 2009;373(9666): p. 781. doi: 10.1016/S0140-6736(09)60456-6
36. James SL, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet*. 2018;392(10159):1789-858. doi: 10.1016/S0140-6736(18)32279-7
37. Smith R, O'Grady L, Jadad AR. In search of health. *J Eval Clin Pract*. 2009;15(4):743-4. doi: 10.1111/j.1365-2753.2009.01263.x
38. World Health Organization. Ottawa Charter for health promotion: First International Conference on Health Promotion. Ottawa: World Health Organization; 1986.
39. *BMJ*. 2008;337:a2900. doi: 10.1136/bmj.a2900
40. Leonardi F. The definition of health: towards new perspectives. *International Journal of Health Services*. 2018;48(4):735-48. doi: 10.1177/0020731418782653
41. Schultz IZ, Chlebak CM, Stewart AM. Impairment, disability, and return to work. In Schultz I, Gatchel R. (eds) *Handbook of Return to Work*. Boston, MA: Springer; 2016 (pp. 3-25). doi: 10.1007/978-1-4899-7627-7\_1
42. Knauf MT, Schultz IZ. Current conceptual models of return to work. In Schultz I, Gatchel R. (eds) *Handbook of Return to Work*. Boston, MA: Springer; 2016 (pp. 27-51). doi: 10.1007/978-1-4899-7627-7\_2
43. Burton C. Beyond somatisation: a review of the understanding and treatment of medically unexplained physical symptoms (MUPS). *Br J Gen Pract*. 2003;53(488):231-9.
44. Schultz IZ, Stowell AW, Feuerstein M, Gatchel RJ. Models of return to work for musculoskeletal disorders. *J Occup Rehabil*. 2007;17(2):327-52. doi: 10.1007/s10926-007-9071-6.
45. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science*. 1977;196(4286):129-36. doi: 10.1126/science.847460
46. Engel GL. The clinical application of the biopsychosocial model. *Am. J. Psychiatry*. 1980;137(5):535-44.
47. Nagi SZ, Burk RD, Potter HR. Back disorders and rehabilitation achievement. *J. Chronic Dis*. 1965;18(2):181-97.
48. Nagi SZ. An epidemiology of disability among adults in the United States. *Milbank Mem Fund Q Health Soc*. 1976;439-67. doi: 10.2307/3349677
49. Loisel P, Buchbinder R, Hazard R, Keller R, Scheel I, Van Tulder M, Webster B. Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *J Occup Rehabil*. 2005;15(4):507-24. doi: 10.1007/s10926-005-8031-2
50. Briand C, Durand MJ, St-Arnaud L, Corbière M. Work and mental health: learning from return-to-work rehabilitation programs designed for workers with musculoskeletal disorders. *Int J Law Psychiatry*. 2007;30(4-5):444-57. doi: 10.1016/j.ijlp.2007.06.014.



51. Hughner RS, Kleine SS. Views of health in the lay sector: A compilation and review of how individuals think about health. *Health*. 2004;8(4):395-422. doi: 10.1177/1363459304045696
52. Chaupain-Guillot S, Guillot O. Sickness benefit rules and work absence: An empirical study based on European data. *Revue d'économie politique*. 2017;127(6):1109-37.
53. Norwegian Directorate of Health. Sykmelderveileder. Nasjonal veileder. Available from: <https://www.helsedirektoratet.no/veiledere/sykmelderveileder>. Accessed 02.10.2020.
54. Cronin S, Curran J, Iantorno J, Murphy K, Shaw L, Boutcher N, Knott M. Work capacity assessment and return to work: a scoping review. *Work*. 2013;44(1):37-55. doi: 10.3233/WOR-2012-01560.
55. Gjesdal S, Ringdal PR, Haug K, Maeland JG. Predictors of disability pension in long-term sickness absence: results from a population-based and prospective study in Norway 1994-1999. *Eur J Public Health*. 2004;14(4):398-405. doi: 10.1093/eurpub/14.4.398
56. Waddell G, Burton AK, Main CJ. Screening to identify people at risk of long-term incapacity for work. A conceptual and scientific review. London, UK: Royal Society of Medicine Press; 2003.
57. Mykletun A, Eriksen HR, Røed K, Schmidt G, Fosse A, Damberg G, Christiansen EC, Guldvog B. Tiltak for reduksjon i sykefravær: Aktiviserings-og nærværreform. Ekspertgrupperapport til arbeidsdepartementet. 2010. Oslo, Norway: Ministry of Labour; 2010.
58. Halonen JI, Solovieva S, Virta LJ, Laaksonen M, Martimo KP, Hiljanen I, Lallukka T, Autti-Rämö I, Viikari-Juntura E. Sustained return to work and work participation after a new legislation obligating employers to notify prolonged sickness absence. *Scand J Public Health*. 2018;46(19\_suppl):65-73. doi: 10.1177/1403494817732445
59. Schultz IZ. Disentangling the disability quagmire in psychological injury: Part 1—Disability and return to work: Theories, methods, and applications. *Psychological Injury and Law*. 2008;1(2):94. doi: 10.1007/s12207-008-9011-6
60. Ekberg K, Ståhl C. Employment as a Key Rehabilitation Outcome. In: Bültmann U., Siegrist J. (eds) *Handbook of Disability, Work and Health*. Handbook Series in Occupational Health Sciences, vol 1. Cham, CH: Springer; 2020:1-20. doi: 10.1007/978-3-319-75381-2\_20-1
61. Lie SA. Evaluering av tiltak for å redusere sykefravær. *Norsk epidemiologi*. 2010;19(2). doi: 10.5324/nje.v19i2.585
62. Waddell G, Burton AK. Concepts of rehabilitation for the management of common health problems. London, UK: The Stationery Office; 2004.
63. Wertli MM, Eugster R, Held U, Steurer J, Kofmehl R, Weiser S. Catastrophizing—a prognostic factor for outcome in patients with low back pain: a systematic review. *Spine J*. 2014;14(11):2639-57. doi: 10.1016/j.spinee.2014.03.003
64. Rashid M, Kristofferzon ML, Nilsson A, Heiden M. Factors associated with return to work among people on work absence due to long-term neck or back pain: a narrative systematic review. *BMJ Open*. 2017;7(6):e014939. doi: 10.1136/bmjopen-2016-014939
65. Valentin GH, Pilegaard MS, Vaegter HB, Rosendal M, Ørtenblad L, Væggemose U, Christensen R. Prognostic factors for disability and sick leave in patients with subacute non-malignant pain: a systematic review of cohort studies. *BMJ Open*. 2016;6(1):e007616. doi: 10.1136/bmjopen-2015-007616
66. Campbell P, Wynne-Jones G, Muller S, Dunn KM. The influence of employment social support for risk and prognosis in nonspecific back pain: a systematic review

- and critical synthesis. *Int Arch Occup Environ Health*. 2013;86(2):119-37. doi: 10.1007/s00420-012-0804-2
67. Steenstra IA, Munhall C, Irvin E, Oranye N, Passmore S, Van Eerd D, Mahood Q, Hogg-Johnson S. Systematic review of prognostic factors for return to work in workers with sub acute and chronic low back pain. *J Occup Rehabil*. 2017;27(3):369-81. doi: 10.1007/s10926-016-9666-x
  68. Ervasti J, Joensuu M, Pentti J, Oksanen T, Ahola K, Vahtera J, Kivimäki M, Virtanen M. Prognostic factors for return to work after depression-related work disability: a systematic review and meta-analysis. *J. Psychiatr. Res*. 2017;95:28-36. doi: 10.1016/j.jpsychires.2017.07.024
  69. Nigatu YT, Liu Y, Uppal M, McKinney S, Gillis K, Rao S, Wang J. Prognostic factors for return to work of employees with common mental disorders: a meta-analysis of cohort studies. *Soc Psychiatry Psychiatr Epidemiol*. 2017;52(10):1205-15. doi: 10.1007/s00127-017-1402-0
  70. Mbengi RK, Otter R, Mortelmans K, Arbyn M, Van Oyen H, Bouland C, De Brouwer C. Barriers and opportunities for return-to-work of cancer survivors: time for action—rapid review and expert consultation. *Syst. Rev*. 2016;5(1):35. doi: 10.1186/s13643-016-0210-z
  71. Duijts SF, Van Egmond MP, Spelten E, Van Muijen P, Anema JR, van der Beek AJ. Physical and psychosocial problems in cancer survivors beyond return to work: a systematic review. *Psychooncology*. 2014;23(5):481-92. doi: 10.1002/pon.3467
  72. Islam T, Dahlui M, Abd Majid H, Nahar AM, Taib NA, Su TT, MyBCC Study Group. Factors associated with return to work of breast cancer survivors: a systematic review. *BMC Public Health*. 2014;14(S8). doi: 10.1186/1471-2458-14-S3-S8
  73. Van Muijen P, Weevers NL, Snels IA, Duijts SF, Bruinvels DJ, Schellart AJ, Van Der Beek AJ. Predictors of return to work and employment in cancer survivors: a systematic review. *Eur. J. Cancer Care*. 2013;22(2):144-60. doi: 10.1111/ecc.12033
  74. Peters S, Johnston V, Hines S, Ross M, Coppieters M. Prognostic factors for return-to-work following surgery for carpal tunnel syndrome: a systematic review. *JBIR Database System Rev Implement*. 2016;14(9):135-216. doi: 10.11124/JBISRIR-2016-003099
  75. Cancelliere C, Kristman VL, Cassidy JD, Hincapié CA, Côté P, Boyle E, Carroll LJ, Stålnacke BM, Nygren-de Boussard C, Borg J. Systematic review of return to work after mild traumatic brain injury: results of the International Collaboration on Mild Traumatic Brain Injury Prognosis. *Arch. Phys. Med. Rehabil*. 2014;95(3):S201-9. doi: 10.1016/j.apmr.2013.10.010
  76. Wang YC, Kapellusch J, Garg A. Important factors influencing the return to work after stroke. *Work*. 2014;47(4):553-9. doi: 10.3233/WOR-131627
  77. Vooijs M, Leensen MC, Hoving JL, Daams JG, Wind H, Frings-Dresen MH. Disease-generic factors of work participation of workers with a chronic disease: a systematic review. *Int Arch Occup Environ Health*. 2015;88(8):1015-29. doi: 10.1007/s00420-015-1025-2
  78. Street TD, Lacey SJ. A systematic review of studies identifying predictors of poor return to work outcomes following workplace injury. *Work*. 2015;51(2):373-81. doi: 10.3233/WOR-141980
  79. Etuknwa A, Daniels K, Eib C. Sustainable return to work: a systematic review focusing on personal and social factors. *J Occup Rehabil*. 2019:1-22. doi: 10.1007/s10926-019-09832-7
  80. Black O, Keegel T, Sim MR, Collie A, Smith P. The effect of self-efficacy on return-to-work outcomes for workers with psychological or upper-body musculoskeletal

- injuries: a review of the literature. *J Occup Rehabil.* 2018;28(1):16-27. doi: 10.1007/s10926-017-9697-y
81. Cancelliere C, Donovan J, Stochkendahl MJ, Biscardi M, Ammendolia C, Myburgh C, Cassidy JD. Factors affecting return to work after injury or illness: best evidence synthesis of systematic reviews. *Chiropr. Man. Ther.* 2016;24(1):1-23. doi: 10.1186/s12998-016-0113-z
  82. Gragnano A, Negrini A, Miglioretti M, Corbière M. Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach. *J Occup Rehabil.* 2018;28(2):215-31. doi: 10.1007/s10926-017-9714-1
  83. Garrelfs SF, Donker-Cools BH, Wind H, Frings-Dresen MH. Return-to-work in patients with acquired brain injury and psychiatric disorders as a comorbidity: a systematic review. *Brain Injury.* 2015;29(5):550-7. doi: 10.3109/02699052.2014.995227
  84. de Wit M, Wind H, Hulshof CT, Frings-Dresen MH. Person-related factors associated with work participation in employees with health problems: a systematic review. *Int Arch Occup Environ Health.* 2018;91(5):497-512. doi: 10.1007/s00420-018-1308-5
  85. Nossen, J.P. and N. Lysø, Gradert sykmelding - Økt gradering, stabil varighet. *Arbeid og velferd*, 2018;2.
  86. Melloh M, Elfering A, Presland CE, Roeder C, Barz T, Salathé CR, Tamcan O, Mueller U, Theis JC. Identification of prognostic factors for chronicity in patients with low back pain: a review of screening instruments. *Int. Orthop.* 2009;33(2):301-13. doi: 10.1007/s00264-008-0707-8
  87. Waddell G, Burton AK, Kendall NA. *Vocational rehabilitation—what works, for whom, and when?* London, UK: The Stationery Office; 2008.
  88. Reme SE. Common Mental Disorders and Work: Barriers and Opportunities. In: Bültmann U, Siegrist J. (eds) *Handbook of Disability, Work and Health.* Cham, CH: Springer; 2020. doi: 10.1007/978-3-030-24334-0\_26.
  89. Mikkelsen MB, Rosholm M. Systematic review and meta-analysis of interventions aimed at enhancing return to work for sick-listed workers with common mental disorders, stress-related disorders, somatoform disorders and personality disorders. *Occup. Environ. Med.* 2018;75(9):675-86. doi: 10.1136/oemed-2018-105073
  90. Nieuwenhuijsen K, Faber B, Verbeek JH, Neumeyer-Gromen A, Hees HL, Verhoeven AC, van der Feltz-Cornelis CM, Bültmann U. Interventions to improve return to work in depressed people. *Cochrane Database Syst. Rev.* 2014(12). doi: 10.1002/14651858.CD006237.pub3
  91. Rivilis I, Van Eerd D, Cullen K, Cole DC, Irvin E, Tyson J, Mahood Q. Effectiveness of participatory ergonomic interventions on health outcomes: a systematic review. *Appl. Ergon.* 2008;39(3):342-58. doi: 10.1016/j.apergo.2007.08.006
  92. Palmer KT, Harris EC, Linaker C, Barker M, Lawrence W, Cooper C, Coggon D. Effectiveness of community-and workplace-based interventions to manage musculoskeletal-related sickness absence and job loss: a systematic review. *Rheumatology.* 2012;51(2):230-42. doi: 10.1093/rheumatology/ker086
  93. de Boer AG, Taskila TK, Tamminga SJ, Feuerstein M, Frings-Dresen MH, Verbeek JH. Interventions to enhance return-to-work for cancer patients. *Cochrane Database Syst. Rev.* 2015(9). doi: 10.1002/14651858.CD007569.pub3
  94. Donker-Cools BH, Daams JG, Wind H, Frings-Dresen MH. Effective return-to-work interventions after acquired brain injury: a systematic review. *Brain Injury.* 2016;30(2):113-31. doi: 10.3109/02699052.2015.1090014

95. Cullen KL, Irvin E, Collie A, Clay F, Gensby U, Jennings PA, Hogg-Johnson S, Kristman V, Laberge M, McKenzie D, Newnam S. Effectiveness of workplace interventions in return-to-work for musculoskeletal, pain-related and mental health conditions: an update of the evidence and messages for practitioners. *J Occup Rehabil.* 2018;28(1):1-5. doi: 10.1007/s10926-016-9690-x.
96. Vooijs M, Leensen MC, Hoving JL, Wind H, Frings-Dresen MH. Interventions to enhance work participation of workers with a chronic disease: a systematic review of reviews. *J. Occup. Environ. Med.* 2015;72(11):820-6. doi: 10.1136/oemed-2015-103062
97. van Vilsteren M, van Oostrom SH, de Vet HC, Franche RL, Boot CR, Anema JR. Workplace interventions to prevent work disability in workers on sick leave. *Cochrane Database Syst. Rev.* 2015(10). doi: 10.1002/14651858.CD006955.pub3
98. Vogel N, Schandelmaier S, Zumbunn T, Ebrahim S, de Boer WE, Busse JW, Kunz R. Return-to-work coordination programmes for improving return to work in workers on sick leave. *Cochrane Database Syst. Rev.* 2017(3). doi: 10.1002/14651858.CD011618.pub2
99. Poulsen OM, Aust B, Bjoerner JB, Rugulies R, Hansen JV, Tverborgvik T, Winzor G, Mortensen OS, Helverskov T, Ørbæk P, Nielsen MB. Effect of the Danish return-to-work program on long-term sickness absence: results from a randomized controlled trial in three municipalities. *Scand J Work Env Hea.* 2014;47-56.
100. Pedersen P, Sogaard HJ, Labriola M, Nohr EA, Jensen C. Effectiveness of psychoeducation in reducing sickness absence and improving mental health in individuals at risk of having a mental disorder: a randomised controlled trial. *BMC Public Health.* 2015;15(1):763. doi: 10.1186/s12889-015-2087-5.
101. Aasdahl L, Pape K, Vasseljen O, Johnsen R, Gismervik S, Halsteinli V, Fleten N, Nielsen CV, Fimland MS. Effect of inpatient multicomponent occupational rehabilitation versus less comprehensive outpatient rehabilitation on sickness absence in persons with musculoskeletal-or mental health disorders: a randomized clinical trial. *J Occup Rehabil.* 2018;28(1):170-9. doi: 10.1007/s10926-017-9708-z
102. Gismervik S, Aasdahl L, Vasseljen O, Fors EA, Rise MB, Johnsen R, Hara K, Jacobsen HB, Pape K, Fleten N, Jensen C. Inpatient multimodal occupational rehabilitation reduces sickness absence among individuals with musculoskeletal and common mental health disorders: a randomized clinical trial. *Scand J Work Env Hea.* 2020. doi:10.5271/sjweh.3882
103. Reneman MF. State of Vocational Rehabilitation and Disability Evaluation in Chronic Musculoskeletal Pain Conditions. In: Escorpizo R, Brage S, Homa D, Stucki G. (eds) *Handbook of Vocational Rehabilitation and Disability Evaluation.* Cham, CH: Springer; 2015. doi: 10.1007/978-3-319-08825-9\_9
104. Aylward SM. Overcoming Barriers to Recovery and Return to Work: Towards Behavioral and Cultural Change. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work.* Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_7
105. Norwegian Labour and Welfare Administration. Sykefraværstatistikk. 2020. Available from: <https://www.nav.no/no/nav-og-samfunn/statistikk/sykefravar-statistikk/sykefravar>. Accessed 02.10.2020.
106. Meld. St. 33 (2015–2016). NAV i en ny tid – for arbeid og aktivitet. Ministry of Labour and Social Affairs; 2016.
107. Roelen CA, Norder G, Koopmans PC, Van Rhenen W, Van Der Klink JJ, Bültmann U. Employees sick-listed with mental disorders: who returns to work and when?. *J Occup Rehabil.* 2012;22(3):409-17. doi: 10.1007/s10926-012-9363-3

108. Bültmann U, Sherson D, Olsen J, Hansen CL, Lund T, Kilsgaard J. Coordinated and tailored work rehabilitation: a randomized controlled trial with economic evaluation undertaken with workers on sick leave due to musculoskeletal disorders. *J Occup Rehabil.* 2009;19(1):81-93. doi: 10.1007/s10926-009-9162-7
109. Steenstra IA, Anema JR, Van Tulder MW, Bongers PM, De Vet HC, Van Mechelen W. Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain. *J Occup Rehabil.* 2006;16(4):557-78. doi: 10.1007/s10926-006-9053-0
110. McLeod CB, Reiff E, Maas E, Bültmann U. Identifying return-to-work trajectories using sequence analysis in a cohort of workers with work-related musculoskeletal disorders. *Scand J Work Env Hea.* 2018;44(2):147-55. doi: 10.5271/sjweh.3701
111. Vargas-Prada S, Demou E, Lalloo D, Avila-Palencia I, Sanati KA, Sampere M, Freer K, Serra C, Macdonald EB. Effectiveness of very early workplace interventions to reduce sickness absence: a systematic review of the literature and meta-analysis. *Scand J Work Env Hea.* 2016;42(4):261. doi: 10.5271/sjweh.3576
112. van Duijn M, Eijkemans MJ, Koes BW, Koopmanschap MA, Burton KA, Burdorf A. The effects of timing on the cost-effectiveness of interventions for workers on sick leave due to low back pain. *Occup. Environ. Med.* 2010;67(11):744-50. doi: 10.1136/oem.2009.049874
113. Aasdahl L, Fimland MS. Is there really a “golden hour” for work disability interventions? a narrative review. *Disabil. Rehabil.* 2020;42(4):586-93. doi: 10.1080/09638288.2018.1503735
114. Croft P, Altman DG, Deeks JJ, Dunn KM, Hay AD, Hemingway H, LeResche L, Peat G, Perel P, Petersen SE, Riley RD. The science of clinical practice: disease diagnosis or patient prognosis? Evidence about “what is likely to happen” should shape clinical practice. *BMC medicine.* 2015;13(1):1-8. doi: 10.1186/s12916-014-0265-4
115. Vickers AJ, Basch E, Kattan MW. Against diagnosis. *Ann. Intern. Med.* 2008;149:3, 200-203. doi: 10.7326/0003-4819-149-3-200808050-00010
116. Foster NE, Hill JC, Hay EM. Subgrouping patients with low back pain in primary care: are we getting any better at it?. *Man Ther.* 2011;16(1):3-8. doi: 10.1016/j.math.2010.05.013
117. Gross DP, Armijo-Olivo S, Shaw WS, Williams-Whitt K, Shaw NT, Hartvigsen J, Qin Z, Ha C, Woodhouse LJ, Steenstra IA. Clinical decision support tools for selecting interventions for patients with disabling musculoskeletal disorders: a scoping review. *J Occup Rehabil.* 2016;26(3):286-318. doi: 10.1007/s10926-015-9614-1
118. Hill JC, Whitehurst DG, Lewis M, Bryan S, Dunn KM, Foster NE, Konstantinou K, Main CJ, Mason E, Somerville S, Sowden G. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet.* 2011;378(9802):1560-71. doi: 10.1016/S0140-6736(11)60937-9
119. Sowden G, Hill JC, Morso L, Louw Q, Foster NE. Advancing practice for back pain through stratified care (STarT Back). *Braz J Phys Ther.* 2018;22(4):255-64. doi: 10.1016/j.bjpt.2018.06.003
120. Reme SE, Shaw WS, Steenstra IA, Woiszwilllo MJ, Pransky G, Linton SJ. Distressed, immobilized, or lacking employer support? A sub-classification of acute work-related low back pain. *J Occup Rehabil.* 2012;22(4):541-52. doi: 10.1007/s10926-012-9370-4
121. Shaw WS, Pransky G, Patterson W, Linton SJ, Winters T. Patient clusters in acute, work-related back pain based on patterns of disability risk factors. *J. Occup. Environ. Med.* 2007;49(2):185-93. doi: 10.1097/01.jom.0000254205.47334.c3

122. Steenstra IA, Ibrahim SA, Franche RL, Hogg-Johnson S, Shaw WS, Pransky GS. Validation of a risk factor-based intervention strategy model using data from the readiness for return to work cohort study. *J Occup Rehabil.* 2010;20(3):394-405. doi: 10.1007/s10926-009-9218-8
123. Shaw WS, Reme SE, Pransky G, Woiszwilllo MJ, Steenstra IA, Linton SJ. The pain recovery inventory of concerns and expectations: a psychosocial screening instrument to identify intervention needs among patients at elevated risk of back disability. *J. Occup. Environ. Med.* 2013;55(8):885-94. doi: 10.1097/JOM.0b013e318289ee6c
124. Gewurtz R, Stergiou-Kita M, Shaw L, Kirsh B, Rappolt S. Qualitative meta-synthesis: Reflections on the utility and challenges in occupational therapy. *Can. J. Occup. Ther.* 2008;75(5):301-8. doi: 10.1177/000841740807500513
125. Thisted CN, Nielsen CV, Bjerrum M. Work participation among employees with common mental disorders: a Meta-synthesis. *J Occup Rehabil.* 2018;28(3):452-64. doi: 10.1007/s10926-017-9743-9
126. Froud R, Patterson S, Eldridge S, Seale C, Pincus T, Rajendran D, Fossum C, Underwood M. A systematic review and meta-synthesis of the impact of low back pain on people's lives. *BMC Musculoskelet. Disord.* 2014;15(1):50. doi: 10.1186/1471-2474-15-50
127. Grant M, Joanne O, Froud R, Underwood M, Seers K. The work of return to work. Challenges of returning to work when you have chronic pain: a meta-ethnography. *BMJ Open.* 2019;9(6):e025743. doi: 10.1136/bmjopen-2018-025743
128. Lännerström L, Wallman T, Holmström IK. Losing independence—the lived experience of being long-term sick-listed. *BMC Public Health.* 2013;13(1):745. doi: 10.1186/1471-2458-13-745
129. Ockander M, Timpka T. A female lay perspective on the establishment of long-term sickness absence. *Int. J. Soc. Welf.* 2001;10(1):74-9. doi: 10.1111/1468-2397.00154
130. Elderkin-Thompson V, Waitzkin H. Differences in clinical communication by gender. *J. Gen. Intern. Med.* 1999;14(2):112-21. doi: 10.1046/j.1525-1497.1999.00296.x
131. McInnis OA, McQuaid RJ, Bombay A, Matheson K, Anisman H. Finding benefit in stressful uncertain circumstances: relations to social support and stigma among women with unexplained illnesses. *Stress.* 2015;18(2):169-77. doi: 10.3109/10253890.2014.1001975
132. Hankivsky O. Women's health, men's health, and gender and health: Implications of intersectionality. *Soc. Sci. Med.* 2012;74(11):1712-20. doi: 10.1016/j.socscimed.2011.11.029
133. Schultz IZ, Chlebak CM, Law AK. Bridging the Gap: Evidence-Informed Early Intervention Practices for Injured Workers with Nonvisible Disabilities. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work.* Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_13
134. Schultz IZ, Gatchel RJ. Where Do We Go From Here in Return to Work Research, Policy, and Practice: A Postscriptum. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work.* Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_37
135. Järholm B. Methodological Issues in Return to Work Intervention Research. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work.* Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_9
136. Aasdahl L, Foldal VS, Standal MI, Hagen R, Johnsen R, Solbjør M, Fimland MS, Fossen H, Jensen C, Bagøien G, Halsteinli V. Motivational interviewing in long-term sickness absence: study protocol of a randomized controlled trial followed by qualitative and economic studies. *BMC Public Health.* 2018;18(1):1-8. doi: 10.1186/s12889-018-5686-0

137. Norwegian Labour and Welfare Administration. Sickness benefits (sykepenger) for employees. 2020. Available from: <https://www.nav.no/en/home/benefits-and-services/Sickness-benefit-for-employees>. Accessed 03.10.2020.
138. Norwegian Labour and Welfare Administration. Hvem gjør hva i sykefraværsarbeidet? 2020. Available from: [https://www.nav.no/no/bedrift/oppfolging/sykmeldt-arbeidstaker/relatert-informasjon/slik-folger-du-opp-sykmeldte/hvem-gjor-hva-i-sykefravaersarbeidet\\_kap](https://www.nav.no/no/bedrift/oppfolging/sykmeldt-arbeidstaker/relatert-informasjon/slik-folger-du-opp-sykmeldte/hvem-gjor-hva-i-sykefravaersarbeidet_kap). Accessed 03.10.2020.
139. NAV. What is the duty to be active? (aktivitetsplikten). 2020. Available from: <https://www.nav.no/en/home/benefits-and-services/what-is-the-duty-to-be-active-aktivitetsplikten>. Accessed 03.10.2020.
140. The Norwegian Labour Inspection Authority. Oppfølging av sykmeldte. 2020. Available from: <https://www.arbeidstilsynet.no/arbeidsforhold/tilrettelegging/oppfolging-av-sykmeldte/>. Accessed 03.10.20
141. Willig C. *Introducing qualitative research in psychology. Adventures in theory and method*. Second edition. Maidenhead: McGraw-Hill Open University Press; 2008.
142. Patton MQ. Enhancing the quality and credibility of qualitative analysis. *Health Serv. Res.* 1999;34(5 Pt 2):1189.
143. Elliott R, Fischer CT, Rennie DL. Evolving guidelines for publication of qualitative research studies in psychology and related fields. *Br J Clin Psychol.* 1999;38(3):215-29. doi: 10.1348/014466599162782
144. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol. Rev.* 1977;84(2):191. doi: 10.1037/0033-295X.84.2.191
145. Rotter JB. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monogr.* 1966;80(1):1. doi: 10.1037/h0092976
146. Giorgi A. *The descriptive phenomenological method in psychology: a modified Husserlian approach*. Pittsburgh, PA: Duquesne University Press; 2009.
147. Malterud K, Siersma VD, Guassora AD. Sample size in qualitative interview studies: guided by information power. *Qual. Health Res.* 2016 Nov;26(13):1753-60. doi: 10.1177/1049732315617444
148. Herdman M, Gudex C, Lloyd A, Janssen MF, Kind P, Parkin D, Bonse G, Badia X. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Qual Life Res.* 2011;20(10):1727-36. doi: 10.1007/s11136-011-9903-x
149. Lagerveld SE, Blonk RW, Brenninkmeijer V, Schaufeli WB. Return to work among employees with mental health problems: development and validation of a self-efficacy questionnaire. *Work Stress.* 2010;24(4):359-75. doi: 10.1080/02678373.2010.532644
150. Hjemdal O, Friborg O, Martinussen M, Rosenvinge JH. Preliminary results from the development and validation of a Norwegian scale for measuring adult resilience. *Journal of the Norwegian Psychological Association.* 2001;38(4):310-7.
151. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch. Intern. Med.* 2006;166(10):1092-7. doi: 10.1001/archinte.166.10.1092
152. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med.* 2001;16(9):606-13. doi: 10.1046/j.1525-1497.2001.016009606.x
153. Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med.* 2001;2(4):297-307. doi: 10.1016/S1389-9457(00)00065-4

154. Mayfield D, McLeod G, Hall P. The CAGE questionnaire: validation of a new alcoholism screening instrument. *Am. J. Psychiatry.* 1974;131(10):1121-3. doi: 10.1176/ajp.131.10.1121
155. Krupp LB, LaRocca NG, Muir-Nash J, Steinberg AD. The fatigue severity scale: application to patients with multiple sclerosis and systemic lupus erythematosus. *Arch. Neurol.* 1989;46(10):1121-3. doi: 10.1001/archneur.1989.00520460115022
156. Lerdal A, Wahl AK, Rustoen T, Hanestad BR, Moum T. Fatigue in the general population: a translation and test of the psychometric properties of the Norwegian version of the fatigue severity scale. *Scand. J. Public Health.* 2005;33(2):123-30. doi: 10.1080/14034940410028406
157. Tuomi K, Ilmarinen J, Eskelinen L, Järvinen E, Toikkanen J, Klockars M. Prevalence and incidence rates of diseases and work ability in different work categories of municipal occupations. *Scand J Work Env Hea.* 1991:67-74.
158. Klepstad P, Loge JH, Borchgrevink PC, Mendoza TR, Cleeland CS, Kaasa S. The Norwegian brief pain inventory questionnaire: translation and validation in cancer pain patients. *J Pain Symptom Manage.* 2002;24(5):517-25. doi: 10.1016/S0885-3924(02)00526-2
159. Cleeland CS, Ryan KM. Pain assessment: global use of the Brief Pain Inventory. *Ann. Acad. Med. Singap.* 1994;23(2):129–138.
160. Kroenke K, Wu J, Yu Z, Bair MJ, Kean J, Stump T, Monahan PO. Patient Health Questionnaire Anxiety and Depression Scale: Initial Validation in Three Clinical Trials. *Psychosom Med.* 2016 Jul-Aug;78(6):716-27. doi: 10.1097/PSY.0000000000000322
161. Friberg O, Hjemdal O, Rosenvinge JH, Martinussen M. A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment?. *Int J Methods Psychiatr Res.* 2003;12(2):65-76. doi: 10.1002/mpr.143
162. Ramachandran S, Lundy JJ, Coons SJ. Testing the measurement equivalence of paper and touch-screen versions of the EQ-5D visual analog scale (EQ VAS). *Qual Life Res.* 2008;17(8):1117-20. doi: 10.1007/s11136-008-9384-8
163. Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. *J Health Soc Behav.* 1997:21-37.
164. Jylhä M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Soc. Sci. Med.* 2009;69(3):307-16. doi: 10.1016/j.socscimed.2009.05.013
165. Kroenke K, Baye F, Lourens SG. Comparative validity and responsiveness of PHQ-ADS and other composite anxiety-depression measures. *J. Affect. Disord.* 2019;246:437-43. doi: 10.1016/j.jad.2018.12.098
166. Jensen MP, Turner JA, Romano JM, Fisher LD. Comparative reliability and validity of chronic pain intensity measures. *Pain.* 1999;83(2):157-62. doi: 10.1016/S0304-3959(99)00101-3
167. Kinnunen U, Nätti J. Work ability score and future work ability as predictors of register-based disability pension and long-term sickness absence: a three-year follow-up study. *Scand J Public Health.* 2018;46(3):321-30. doi: 10.1177/1403494817745190
168. Ahlstrom L, Grimby-Ekman A, Hagberg M, Dellve L. The work ability index and single-item question: associations with sick leave, symptoms, and health—a prospective study of women on long-term sick leave. *Scand J Work Env Hea.* 2010;404-12.
169. Fleten N, Johnsen R, Førde OH. Length of sick leave—Why not ask the sick-listed? Sick-listed individuals predict their length of sick leave more accurately than professionals. *BMC Public Health.* 2004;4(1):46. doi: 10.1186/1471-2458-4-46



170. StataCorp. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC; 2017.
171. StataCorp. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC; 2019.
172. Giorgi, A., The Descriptive Phenomenological Psychological Method. *J Phenomenol Psychol.* 2012. 43(1):3-12. doi: 10.1163/156916212X632934
173. Kongsted A, Nielsen AM. Latent class analysis in health research. *J Physiother.* 2017;1(63):55-8. doi: 10.1016/j.jphys.2016.05.018
174. Magidson J, Vermunt J. Latent class models for clustering: A comparison with K-means. *Can J Mark Res.* 2002;20(1):36-43.
175. Stahl D, Sallis H. Model-based cluster analysis. *Wiley Interdiscip Rev Comput Stat.* 2012;4(4):341-58. doi: 10.1002/wics.1204
176. Masyn KE. Latent Class Analysis and Finite Mixture Modeling. In Little TD, editor. *The Oxford Handbook of Quantitative Methods. Vol. 2: Statistical Analysis.* Oxford, UK: Oxford University Press; 2013:551.
177. StataCorp. Stata 15 Base Reference Manual. College Station, TX: Stata Press; 2017.
178. Sclove SL. Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika.* 1987;52(3):333-43.
179. Volker D, Zijlstra-Vlasveld MC, Brouwers EP, Van Lomwel AG, Van Der Feltz-Cornelis CM. Return-to-Work Self-Efficacy and Actual Return to Work Among Long-Term Sick-Listed Employees. *J Occup Rehabil.* 2015;25(2):423-31. doi: 10.1007/s10926-014-9552-3
180. Weerdesteijn KH, Schaafsma F, Bonefaas-Groenewoud K, Heymans M, Van der Beek A, Anema J. Predicting return to work after long-term sickness absence with subjective health complaints: a prospective cohort study. *BMC Public Health.* 2020;20(1):1-3. doi: 10.1186/s12889-020-09203-5
181. Ekberg K, Wåhlin C, Persson J, Bernfort L, Öberg B. Early and Late Return to Work After Sick Leave: Predictors in a Cohort of Sick-Listed Individuals with Common Mental Disorders. *J Occup Rehabil.* 2015;25(3):627-37. doi: 10.1007/s10926-015-9570-9
182. de Vries H, Fishta A, Weikert B, Sanchez AR, Wegewitz U. Determinants of sickness absence and return to work among employees with common mental disorders: a scoping review. *J Occup Rehabil.* 2018;28(3):393-417. doi: 10.1007/s10926-017-9730-1
183. Markussen S, Mykletun A, Røed K. The case for presenteeism—Evidence from Norway's sickness insurance program. *J Public Econ.* 2012;96(11-12):959-72. doi: 10.1016/j.jpubeco.2012.08.008
184. Black CM. Working for a healthier tomorrow: Dame Carol Black's review of the health of Britain's working age population. London, UK: The Stationery Office; 2008.
185. Nielsen K, Yarker J, Munir F, Bültmann U. IGLOO: A Framework for Return to Work Among Workers with Mental Health Problems. In: Bültmann U., Siegrist J. (eds) *Handbook of Disability, Work and Health. Handbook Series in Occupational Health Sciences, vol 1.* Cham, CH: Springer; 2020:1-18. doi: 10.1007/978-3-030-24334-0\_38
186. Brouwer S, Reneman MF, Bültmann U, Van der Klink JJ, Groothoff JW. A prospective study of return to work across health conditions: perceived work attitude, self-efficacy and perceived social support. *J Occup Rehabil.* 2010;20(1):104-12. doi: 10.1007/s10926-009-9214-z

187. MacEachen E, Clarke J, Franche RL, Irvin E, Workplace-based Return to Work Literature Review Group. Systematic review of the qualitative literature on return to work after injury. *Scand J Work Env Hea*. 2006;257-69.
188. Lagerveld SE, Blonk RW, Brenninkmeijer V, Wijngaards-de Meij L, Schaufeli WB. Work-focused treatment of common mental disorders and return to work: a comparative outcome study. *J. Occup. Health Psychol*. 2012;17(2):220. doi: 10.1037/a0027049
189. de C Williams AC, Eccleston C, Morley S. Psychological therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database Syst. Rev*. 2012(11). doi: 10.1002/14651858.CD007407.pub3
190. Sullivan M.J.L. Cognitive-Behavioral Approach to Return to Work. In: Schultz I., Gatchel R. (eds) *Handbook of Return to Work. Handbooks in Health, Work, and Disability*, vol 1. Boston, MA; Springer;2016. doi: 10.1007/978-1-4899-7627-7\_20
191. French KA, Dumani S, Allen TD, Shockley KM. A meta-analysis of work–family conflict and social support. *Psychol. Bull*. 2018;144(3):284. doi: 10.1037/bul0000120
192. Hemmings, P, Prinz C. *Sickness and disability systems: comparing outcomes and policies in Norway with those in Sweden, the Netherlands and Switzerland*. Paris, FR: OECD Publishing; 2020. doi: 10.1787/c768699b-en
193. van der Wel KA, Bambra C, Dragano N, Eikemo TA, Lunau T. Risk and resilience: Health inequalities, working conditions and sickness benefit arrangements: An analysis of the 2010 European Working Conditions survey. *Sociol Health Illn*. 2015;37(8):1157-72. doi: 10.1111/1467-9566.12293
194. Choi Y, Asih SR, Polatin PB. understanding Motivation to Return to Work: The Economy of Gains and Losses. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work. Handbooks in Health, Work, and Disability*, vol 1. Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_4
195. Charmaz K. Loss of self: a fundamental form of suffering in the chronically ill. *Sociol Health Illn*. 1983;5(2):168-95. doi: 10.1111/1467-9566.ep10491512
196. Steenstra IA, Verbeek JH, Heymans MW, Bongers PM. Prognostic factors for duration of sick leave in patients sick listed with acute low back pain: a systematic review of the literature. *Occup Environ Med*. 2005;62(12):851–860. [https://doi:10.1136/oem.2004.015842](https://doi.org/10.1136/oem.2004.015842)
197. Foldal VS, Standal MI, Aasdahl L, Hagen R, Bagøien G, Fors EA, Johnsen R, Solbjør M. Sick-listed workers’ experiences with motivational interviewing in the return to work process: a qualitative interview study. *BMC Public Health*. 2020;20(1):1-0. doi: 10.1186/s12889-020-8382-9
198. Miller WR, Rollnick S. *Motivational interviewing: Helping people change*, 3rd edition. New York, NY: Guilford Press; 2013.
199. Durand MJ, Vézina N, Richard MC. Concept of Margin of Manoeuvre in Return to Work. In: Schultz I, Gatchel R. (eds) *Handbook of Return to Work. Handbooks in Health, Work, and Disability*, vol 1. Boston, MA: Springer; 2016. doi: 10.1007/978-1-4899-7627-7\_3
200. Aas RW, Ellingsen KL, Lindøe P, Möller A. Leadership qualities in the return to work process: a content analysis. *J Occup Rehabil*. 2008;18(4):335. doi: 10.1007/s10926-008-9147-y
201. Haveraaen LA, Skarpaas LS, Berg JE, Aas RW. Do psychological job demands, decision control and social support predict return to work three months after a return-to-work (RTW) programme? The rapid-RTW cohort study. *Work*. 2015;53(1):61-71. doi: 10.3233/WOR-152216

202. Kristman VL, Boot CR, Sanderson K, Sinden KE, Williams-Whitt K. Implementing Best Practice Models of Return to Work. In: Bültmann U., Siegrist J. (eds) *Handbook of Disability, Work and Health. Handbook Series in Occupational Health Sciences*, vol 1. Cham, CH: Springer; 2020. doi: 10.1007/978-3-030-24334-0\_32
203. Ose SO, Dyrstad K, Brattlid I, Slettebak R, Jensberg H, Mandal R, Lippestad J, Pettersen I. *Oppfølging av sykmeldte–fungerer dagens regime?* Trondheim, NO: SINTEF; 2013.
204. Seing I, MacEachen E, Ekberg K, Ståhl C. Return to work or job transition? Employer dilemmas in taking social responsibility for return to work in local workplace practice. *Disabil. Rehabil.* 2015;37(19):1760-9. doi: 10.3109/09638288.2014.978509
205. Riis-Johansen MO, Halvorsen K, Andenæs E, Hammerstad GT. Interaksjon med brukere i Nav. *Tidsskrift for velferdsforskning.* 2018;21(03):227-40.
206. Flodgren GM, Berg RC. Motivational Interviewing as a method to facilitate return to work: a systematic review. Report–2017. Oslo: Norwegian Institute of Public Health, 2017.
207. Markussen S, Røed K, Schreiner RC. Can compulsory dialogues nudge sick-listed workers back to work? *Econ. J.* 2018;128(610):1276-303. doi: 10.1111/econj.12468
208. Nossen JP, Brage S. Aktivitetskrav og midlertidig stans av sykepengen - hvordan påvirkes sykefraværet? *Arbeid og velferd.* 2015;3.
209. Gerhard T. Bias: considerations for research practice. *Am J Health Syst Pharm.* 2008;65(22):2159-68. doi: 10.2146/ajhp070369
210. Galdas P. Revisiting Bias in Qualitative Research: Reflections on Its Relationship With Funding and Impact. *Int. J. Qual. Methods.* 2017. doi: 10.1177/1609406917748992
211. Smith J, Noble H. Bias in research. *Evid Based Nurs.* 2014;17(4):100-1. doi: 10.1136/eb-2014-101946
212. Morse JM, Barrett M, Mayan M, Olson K, Spiers J. Verification strategies for establishing reliability and validity in qualitative research. *Int J Qual Methods.* 2002;1(2):13-22. doi: 10.1177/160940690200100202
213. Bjelland I, Lie SA, Dahl AA, Mykletun A, Stordal E, Kraemer HC. A dimensional versus a categorical approach to diagnosis: anxiety and depression in the HUNT 2 study. *Int J Methods Psychiatr Res.* 2009;18(2):128-37. doi: 10.1002/mpr.284
214. Van Eerd D, Smith P. Work-Related Interventions to Reduce Work Disability Related to Musculoskeletal Disorders. In: Bültmann U., Siegrist J. (eds) *Handbook of Disability, Work and Health. Handbook Series in Occupational Health Sciences*, vol 1. Cham, CH: Springer; 2020. doi: 10.1007/978-3-030-24334-0\_27
215. Alper BS, Haynes RB. EBHC pyramid 5.0 for accessing preappraised evidence and guidance. *BMJ Evid Based Med.* 2016;21(4):123-5. doi: 10.1136/ebmed-2016-110447
216. Cornelius LR, Van der Klink JJ, Groothoff JW, Brouwer S. Prognostic factors of long term disability due to mental disorders: a systematic review. *J Occup Rehabil.* 2011;21(2):259-74. doi: 10.1007/s10926-010-9261-5
217. Lagerveld SE, Bültmann U, Franche RL, Van Dijk FJ, Vlasveld MC, van der Feltz-Cornelis CM, Bruinvels DJ, Huijs JJ, Blonk RW, Van Der Klink JJ, Nieuwenhuijsen K. Factors associated with work participation and work functioning in depressed workers: a systematic review. *J Occup Rehabil.* 2010;20(3):275-92. doi: 10.1007/s10926-009-9224-x
218. Nieuwenhuijsen K, Verbeek JH, De Boer AG, Blonk RW, Van Dijk FJ. Supervisory behaviour as a predictor of return to work in employees absent from work due to

- mental health problems. *Occup Environ Med.* 2004;61(10):817-23. doi: 10.1136/oem.2003.009688
219. Murad MH, Asi N, Alsawas M, Alahdad F. New evidence pyramid. *BMJ Evid Based Med.* 2016;21(4):125-7. doi: 10.1136/ebmed-2016-110401
  220. Rothman KJ, Greenland S, Lash TL, editors. *Modern epidemiology.* Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
  221. Pannucci CJ, Wilkins EG. Identifying and avoiding bias in research. *Plast. Reconstr. Surg.* 2010;126(2):619. doi: 10.1097/PRS.0b013e3181de24bc
  222. Sliper JO. Faktafredag - 1 av 3 trøndere har universitets- eller høyskoleutdanning. Trøndelag Fylkeskommune; 2019. Retrieved from: <https://www.trondelagfylke.no/vare-tjenester/plan-og-areal/kart-statistikk-og-analyse/nyhetsarkiv-kart-og-statistikk/faktafredag---1-av-3-trondere-har-universitets--eller-hoyskoleutdanning/>. Accessed 06.10.2020.
  223. Jepsen P, Johnsen SP, Gillman MW, Sørensen HT. Interpretation of observational studies. *Heart.* 2004;90(8):956-60. doi: 10.1136/hrt.2003.017269
  224. Markussen S, Røed K, Røgeberg O. The changing of the guards: can family doctors contain worker absenteeism? *J. Health Econ.* 2013;32(6):1230-9. doi: 10.1016/j.jhealeco.2013.10.005
  225. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol.* 2003;88(5):879. doi: 10.1037/0021-9010.88.5.879
  226. Øyeflaten I, Lie SA, Ihlebæk C, Brage S, Eriksen HR. Comparison of self-reported and register data on sickness absence among Norwegian patients participating in an occupational rehabilitation program. *Norsk epidemiologi.* 2009;19(2). doi: doi.org/10.5324/nje.v19i2.586
  227. Svedberg P, Ropponen A, Lichtenstein P, Alexanderson K. Are self-report of disability pension and long-term sickness absence accurate? Comparisons of self-reported interview data with national register data in a Swedish twin cohort. *BMC Public Health.* 2010;10(1):763. doi: 10.1186/1471-2458-10-763
  228. Statistics Norway. Educational attainment of the population. 2020. Retrieved from: <https://www.ssb.no/en/utdanning/statistikker/utniv>. Accessed 06.10.2020.
  229. Pitney WA. Strategies for establishing trustworthiness in qualitative research. *Int J Athl Ther Train.* 2004;9(1):26-8. doi: 10.1123/att.9.1.26
  230. *BMJ* 2009;338:b2393. doi: 10.1136/bmj.b2393
  231. Nieuwenhuijsen K, Noordik E, van Dijk FJ, van der Klink JJ. Return to work perceptions and actual return to work in workers with common mental disorders. *J Occup Rehabil.* 2013;23(2):290-9. doi: 10.1007/s10926-012-9389-6
  232. Hancock M, Herbert RD, Maher CG. A guide to interpretation of studies investigating subgroups of responders to physical therapy interventions. *Phys Ther.* 2009;89(7):698-704. doi: 10.2522/ptj.20080351

# Paper I



## **Health, work and family strain - psychosocial experiences at the early stages of long-term sickness absence**

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## **Abstract**

**Background:** Knowledge about the psychosocial experiences of sick-listed workers in the first months of sick leave is sparse even though early interventions are recommended. The aim of this study was to explore psychosocial aspects of sick listed individual's experiences with being on sick leave after 8–12 weeks of sickness absence, and their expectations and thoughts about returning to work.

**Methods:** Sixteen individuals were included at eight weeks of sick leave and participated in semi-structured individual interviews. Data was analysed through Giorgi's descriptive phenomenological method.

**Results:** Three themes emerged: (1) energy depleted, (2) losing normal life, (3) searching for a solution. A combination of health, work and family challenges contributed to being drained of energy, which affected both work- and non-work roles. Being on sick leave led to a loss of social arenas and their identity as a contributing member of society. Participants required assistance to find solutions towards returning to work.

**Conclusions:** Even in this early stage of long-term sick leave, sick listed workers faced complex challenges in multiple domains. Continuing sick leave was experienced as necessary but may challenge personal identity and social life. Those not finding solutions may benefit from additional early follow-up that examine work-related, social and personal factors that influence return to work.

**Keywords:** mental disorders, burnout, musculoskeletal disorders, long-term sick leave, return to work, work-family conflict, work-life balance, social identity, unselected diagnoses



## Background

Long-term sickness absence is a significant challenge in industrialised countries [1] and prolonged sickness absence is associated with adverse health outcomes, multimorbidity and an increased risk of permanent disability for individuals [2,3]. Hence, early return to work (RTW) interventions are recommended [3-5] and interventions between 8–12 weeks of sick leave are proposed to be a sensible approach [6,7]. As many prognostic factors for RTW are shared across diagnoses, returning to work has been suggested to be a general process [8]. However, attempts at finding effective broad interventions have shown inconsistent results [9-13]. Such difficulties in finding effects could be due to the multifaceted problems that sick-listed individuals face, which involve interactions between the individual, the workplace, health services and social surroundings [14]. Thus, length of sick leave is not only influenced by health status, but also individual expectations, perceptions, as well as family life, work environment and workplace support [15-19].

In modern society these work and non-work roles converge and impact each other [20] and the theory of role strain states that different obligations for the various social roles (e.g. at work, family, leisure) may not be compatible. Conforming to one role may lead to not fulfilling another as well as difficulty in meeting the demands of the roles [21]. This can be reflected in the findings that stressful family situations and a demanding work life are common experiences among long-term sick-listed individuals [22-25]. Following the role strain theory, the double burden hypothesis suggests that multiple roles, such as being employed and a parent, may increase work strain, leading to adverse health outcomes and an increased risk of sickness absence [26].

Needing sick leave may also by itself influence an individual's social roles. More than half a century ago, Parsons outlined the theory of the 'sick role' where the sick individual is seen as having lost the capacity to do valued tasks, albeit not being responsible for falling ill [27]. This loss of capacity affects all of the individual's roles at work and outside of work [28]. Consequently, the person is exempt from their normal roles and obligations and enters a 'sick role' where their new obligation is to spend their time and effort to get well as quickly as possible [27]. The expected behaviour in the sick role is to withdraw from society, even if this would cause a loss of esteem [28]. This social cost of being on sick leave has also been found in more recent research concerning how working is important to the individual's identity and social life [29-31].

Research on experiencing sick leave is extensive, but research focusing on the early stages of long-term sick leave is scarce. Previous research has commonly been performed with undefined or varied sick leave length, or with participants sick listed for several months or years who might not recall their earliest months of sick leave [31]. These experiences may not be well-suited to inform early interventions. Research has also focused on specific genders, occupations or diagnoses [15,32]. It is likely that individuals with different genders, diagnoses or occupations may have different experiences of sick leave [33,34]. However, it is important to know which experiences might be shared, especially considering the large heterogeneity within, and similarities between, such groups [35]. Professionals aiming to support RTW have expressed a need to understand sick-listed individuals' broader life-worlds [36]. Therefore, exploring cross-diagnostic psychosocial experiences of being sick listed in the early stages of sick leave could inform the design of early interventions and RTW follow-up.

The aim of this study was to explore psychosocial aspects of sick listed individual's experiences with being on sick leave after 8–12 weeks of sickness absence, and expectations and thoughts about returning to work.

## **Methods**

This is a phenomenological interview study nested within a randomised controlled trial (RCT) evaluating the effect of motivational interviewing on sickness absence [37].

### ***Study setting: Follow-up of sick-listed workers in Norway***

In Norway, employees are entitled to 12 months of full wage benefits when on sick leave. The first 16 days of sick leave are paid by the employer and the rest is paid for by the National Insurance Scheme through the Norwegian Labour and Welfare Administration (NAV) [38]. Sick leave is also encouraged to be graded, meaning that employees work a percentage corresponding to their current work ability.

The employer has the main responsibility for assisting the sick-listed worker back to work. Within the first four weeks of sick leave, the employer and sick-listed worker are obliged to create a plan detailing measures which can help the sick-listed return to work.

Within seven weeks, the employer is required to arrange a meeting with the sick-listed worker that may also include other relevant stakeholders. If work-related activities are not resumed within eight weeks, an expanded medical certificate that documents medical problems preventing such activities is required. Before six months have passed, a mandatory dialogue-meeting must be arranged by NAV. This meeting includes the NAV caseworker, the employer, the sick-listed worker and, in some cases, the general practitioner (GP). The sick-listed worker can, at any time, request a meeting with a NAV caseworker or request a dialogue-meeting that also involves the employer [39].

### ***Recruitment and participants***

Eligible participants in the present study were workers aged 18–60 years living in Central Norway who were at eight weeks of sick leave with a current sick leave status of 50–100% and an unselected diagnosis. In total, 73 participants who had consented to participate in the RCT between November 2017 and February 2018 were contacted by one of the authors via e-mail and invited to participate in an interview about their situation. Thirteen women and three men with current sick leave length of 9 to 13 weeks and an age range of 32–59 participated in the study (see Table 1 for descriptive information). No researchers in the present study had any prior relationship with the participants.

Table 1 here

### ***Data collection***

Prior to inviting participants, we estimated the need for 10–15 interviews based on our research aim and the experience of the interviewers, guided by the concept information power [40]. The necessary number of interviews in order to achieve saturation was evaluated consecutively from nine interviews until completion based on dialogue quality and information obtained. No thematically new information was obtained from the final three interviews, closing the data collection at sixteen interviews. The quality of information obtained from our informants was considered satisfactory for describing the experiences of the participants. Interviews were performed at a university campus by one of the researchers (MIS or VSF). Written informed consent was obtained prior to the interviews. Individual interviews were chosen, as they provided a safe space for rich, in-depth descriptions from

each individual and allowed for follow-up questions when necessary. Each interview followed a semi-structured interview guide with five broad major questions (See Table 2).

Table 2 here

Each question was followed by prompts focusing on participant experiences with regards to family, friends, work, co-workers, supervisors, the welfare system, their general practitioners and other healthcare services. All interviews were audio recorded and were transcribed verbatim.

### *Analysis*

Data was analysed using Giorgi's descriptive phenomenological method [41] which offers a method for gaining knowledge of a specific phenomenon, such as being on sick leave. Descriptive phenomenology attempts to understand how something is experienced from the perspective of the person undergoing the experience and is not interested in whether these experiences are true or false. The method thus allows for examination of the subjective experiences of individuals and how people create meaning in their situations [41]. In order to describe the phenomenon as experienced by the participants, it is necessary for the researchers to reflect on and set aside preconceived assumptions, also known as bracketing [41]. Preconceived assumptions were reflected upon individually and then discussed by all researchers in an early meeting to reduce their impact on data collection and analysis.

The analytic steps undertaken in this study were as outlined by Giorgi [41]:

- (1) Reading the complete interview transcript to get an overview of the individual's situation.
- (2) Re-reading the transcript and breaking the data into parts by marking whenever there was a transition of meaning in the data, creating meaning units.
- (3) Transforming the data from meaning units into expressions that more generally described the issue in the meaning unit while still holding true to the specific situation.

- (4) Developing the theme(s) of the interview by organising the expressions in the previous step. These themes are general expressions of the descriptions found in the interview.

These four steps were undertaken for all interviews by MIS and VSF (see Table 3 for an example). All other authors developed themes from two to four interviews each, which were then discussed in group sessions. Thus, all interviews were analysed by at least three authors to reduce the impact of preconceptions from a single researcher. The themes from each interview were then combined into three major themes that described the situation for most participants in the study.

Table 3 here

## **Results**

Three major themes emerged from the analysis: (1) energy depleted, (2) losing normal life, and (3) searching for a solution. The first two themes concerned participants' experiences with being on sick leave, while the latter theme focused on their thoughts regarding returning to work. Each theme will be presented in detail below.

### ***Energy depleted***

Participants experienced a situation where a combination of health issues and work and family stressors were experienced as energy draining, and they contributed to an inability to function to the participants' standards in either arena. Participants commonly struggled with symptoms such as pain, fatigue, dizziness, low blood pressure, memory or concentration problems:

*F 33: 'So I've been dizzy since January, that's my thing, but I didn't get sick leave until May. [...] I used to come home from work exhausted [...], take care of the kid, and then just sleep until I got up for work the next day.'*

Being on sick leave was experienced as necessary to distribute their remaining time and energy to better manage their recovery and other simultaneous stressors. In their personal life, such stressors were often related to responsibilities towards their children. This could lead to challenges since the welfare system does not allow sick leave due to care responsibilities.

*F 39: '... this time I'm on leave to a larger degree because of my daughter, who is struggling with mental illness, [...] I've arranged with my GP that I can use a [burnout] diagnosis to be able to be home.'*

However, such stressful family situations on their own could also contribute to exhaustion and ill health. Experiences of overwhelming care responsibilities were not described by the male respondents, who rather described being able to better prioritise family life when sick listed.

Aspects of the participants' work could also contribute to the perceived necessity of sick leave in their current situation. These aspects could include consistently having a high work load or adjusting to new energy-demanding work roles. Some individuals also disliked their job, which led to questions about whether to find a new job, but economic and social commitments made it hard to decide whether to stay or attempt to change jobs:

*M 38: 'If you feel that there is something at the workplace that is difficult [...], the line of business is not right for you or the role you have is not right. [...]. This is not something that the GP or employer can fix, and when you have commitments with family and stuff, you can't just leave to follow some kind of dream.'*

For those with less demanding family or work life, sick leave was nonetheless necessary in order to have energy left after treatment so they could function in their personal life while recovering. Without the capacity to do work, there was no use in them being at work:

*F 58: 'the way I am now, I think it's OK to be on sick leave because I'm ill and then it's OK. [...] the disease makes me tired ... a loss of concentration and capacity really. [...] so I need to rest and I can't function at work so then it's OK to be on sick leave.'*

Participants thus experienced sick leave as providing a necessary respite in an overwhelming situation. Sick leave provided the opportunity to prioritise their time and energy to better cope with their recovery and personal life.

### ***Losing normal life***

Needing sick leave to resolve their problems was not without challenges. Working was important to the participants, as work was an arena where they felt appreciated and

competent. Working made them feel that they contributed to their workplace, family and/or to society.

*F 59: 'This is not a situation I like to be in. I enjoy being at work. I enjoy filling my days with something ... so I know that I'm useful. So being on sick leave ... but I have to ... the way I am now, because I can't go to work now. [The pain] will get worse if I'm at work.'*

Being sick listed thus challenged their identity as hard-working, contributing members of society, and they experienced an implicit expectation that they should go to great lengths to work even if they were sick. Sick leave was viewed as a last resort, and some now realised they should have started sick leave earlier:

*F 45: 'I have a teenager that is acting out and it's just a lot to handle right now [...] and if you're up all night arguing with a teenager you can't sleep at the same time. So then it's completely unrealistic to go to work the next day. It's not reasonable to go on like that and you just do a poor job. [...] so I probably worked a month longer than I should have. [...] last month was horribly bad. I just wasn't present at work.'*

Thoughts related to losing their identity as a contributing member of society also caused social challenges, as they wanted to appear normal despite feeling abnormal. Aspects such as uncertainty in diagnosis or prognosis could more readily be shared with their employers and colleagues, while other issues, such as unhappiness with their work or needing sick leave to care for a family member, were kept out of the conversations. Even when experiencing support, they were reluctant to talk too much about their situation, as it could be overwhelming for others and a negative focus. One had experienced such discomfort at a social occasion with colleagues:

*M 47: 'I looked forward to the event [...] and there was a lot of nice conversation, but there was also a lot of talk about me and my neck, which is not what I wanted. [...] and people ask because they care [...] but it can be too much.'*

Participants also struggled with expressing why they sometimes felt fine, but at other times were exhausted:

*F 58: 'I have friends that have asked how long I'm going to be on sick leave. And I tell them I don't know but the doctors say it could be two-three months [...]. Then they get surprised because I look just fine and when I talk to them I sound fine. What they*

*don't see is when I've spent an hour or two with friends or some other small task, I'm stuck in my reclining chair for a couple of hours. They don't see that.'*

Those who had few objective signs of illness or were having problems finding a clear diagnosis often felt a greater need to explain their situation. Some experienced that their explanations and reasons for sick leave were perceived as illegitimate. This led to avoiding activities, social events and neighbours in order to avoid questions about why they were out while being sick listed or why they were at home and not at work during the daytime. Some self-imposed such ideas:

*F 33: 'No one is preventing me ... I mean, my illness may prevent me, and I need to take that into consideration, but neither my employer or NAV or anyone is limiting me [...]. That's not the problem when I go to [a concert]. It is allowed, actually, but no ... I just feel uncomfortable, socially speaking.'*

For those who enjoyed their work environment, sick leave caused them to lose work as an arena for social interaction. This was added to the social avoidance behaviour outside of work and contributed to an experience of being excluded:

*F 33: 'When I'm on sick leave, I don't have the energy to meet people because I kind of have to focus on getting better. [...] So I've gone from being very involved at work to not knowing anything about what's happening, and I feel like that's an extra burden as well.'*

Thus, being on sick leave challenged the participants' identity and impeded their social life, which contributed to the feeling of being abnormal.

### ***Searching for a solution***

Participants needed assistance in order to find solutions to resolve their challenges and progress towards returning fully to work. All participants described much effort through examinations and treatment from their GP and healthcare services; however, some expected a faster recovery than what was reality.

*M 47: 'I didn't realise that the pain that day would side-line me for so long. I thought I might get an hour or two with the chiropractor and then I'm done. Do some stretches ... but it didn't work that way.'*



Finding a diagnosis that explained their symptoms could also be challenging. This caused uncertainty as to how they were going to make progress.

*M 38: 'I'm at the hospital and we do x-rays, we do ultrasound, we do all the tests and everything is OK. The heart is fine, there is no hormonal imbalance, no Lyme disease, so I'm left here after months of examinations with nothing. And I ask my GP: What do I do? I want to be well, I want to function, so what's the deal?'*

Lacking a solution also contributed to a feeling that returning to work was dependent on factors outside of their control. Such factors included improvement related to their child's situation, figuring out what was causing their own symptoms or a sudden improvement in their health:

*F 39: 'It's difficult to say when ... it depends on [what happens to my daughter]. It's not about how I feel, because I feel pretty OK now you know.'*

*F 35 '... my diagnosis is one that may pass just as fast as it came. Just by doing exercises and relaxing, and then you can wake up the next morning and be well. It has not happened yet, but we are hoping.'*

In addition to health services, assistance from their employers was also important. The employer could assist through emotional support and by accommodations at work, such as changed responsibilities or flexible work hours. This helped to reduce the uncertainty of whether they could cope with the expected work demands and reduced the threshold of whether they would attempt a return to work.

Nearly all participants were aware of the negative aspects of social isolation and inactivity in sickness absence. In cooperation with their GP, they tried to remain active and not lose contact with their workplace. Graded leave was common, and using graded sick leave allowed them to keep in contact with their workplace, test their work capacity and to have enough energy left to function outside of work. Graded sick leave was also used to normalise their situation and alleviate some of the social stigma:

*M 38: 'I'm thinking, I have to be home. I'm sick. I can't go out and have a burger and a beer with a buddy because that might look bad. Those from work may not understand that I'm generally not well, but I might have a good day. [...] "if you're well enough to go out, you're well enough to be at work". [...] this is one of the reasons why I want to be on graded leave, because then I can live more normally.'*

Employers were mostly experienced as being supportive, as they largely let the sick-listed individuals determine the return to work pace and attempted to adjust their work tasks in order to fit graded sick leave. When determining the return to work pace, the sick-listed individual's focus was finding a pace that balanced work, health and personal life.

*F 50: 'When I'm going to start to work 100% again, I think I need a deal with my employer and my GP that if I'm coming home from work exhausted and can't do anything ... then I think it's too early to start 100%. Because I'm going to have a life outside of work, too ... and we need to see how we can work that out.'*

Fear of a more difficult situation due to returning to work too quickly was a major concern. Uncertainty in their work ability led to worry that if they returned to work faster than they could manage, it could result in a worsening of their health or their personal situation:

*F 35: '...knowing that I'm going to be [at this job] for many years contributes to being able to take this time off and make my head work again. [...] and really get well, not just going to work [sooner] and becoming worse. And then it will take even longer.'*

If the job inherently contained undesirable tasks, or if the sick-listed individual was unhappy at work, they realised that there was little the employer could do.

*M 38: 'I've thought about this [...] maybe I should do something that is more meaningful for me. [...] Instead of trying to sell as much stuff as possible, maybe do something that can help people. [...] I don't know how the employer can make adjustments for my situation, because here we are talking about the line of work you are in.'*

The assistance the sick-listed workers received from NAV consisted of a standardised letter informing them of their duties and rights during sick leave. Some were surprised by this and stated that they expected more contact. Most wondered how NAV could know if they were progressing toward return to work. They did, however, differ in their perceived need for help from NAV. Finding a solution in order to make progress towards returning to work was not always easy. Those who did not find solutions from other services and were uncertain about how to make progress generally expressed more need for NAV involvement, but only one individual initiated contact on her own. Others viewed early sick leave as a situation where

the sick-listed, their GP and employer are in control and suggested that NAV should not interfere.

## **Discussion**

This study explored psychosocial experiences with sick leave and thoughts about returning to work among individuals with 9–13 weeks of sick leave. In addition to health issues, challenges related to work and family life also contributed to the need for sick leave. Even though being on sick leave had a negative impact on their identity and social life, participants viewed sick leave as necessary in order to distribute their energy to resolve their challenges. Return to work was desirable, but depended on their health and overall situation, and participants needed assistance in order to find solutions that would help them progress towards returning fully to work.

For participants in the current study, a combination of health issues and family or work stress contributed to a situation where they felt drained of energy, and this made functioning outside of work incompatible with recovery and working. The theory of role strain describes the difficulty of fulfilling role obligations due to excessive strain [21]. Experiencing pressure to devote time and attention beyond one's capabilities to a single role obligation will increase strain for the individual [21]. According to the negative emotional spill-over effect, stress at work can lead to negative feelings, such as worry, doubt, disappointment and frustration, that spill over into private life and make it difficult to pursue a satisfying non-work life [42]. On the other hand, demands in private life also influence work and health, but have received less attention. For example, individuals might experience increased strain due to illness or responsibilities in their family that affect time and energy available for the other arenas in their life [43]. The double burden hypothesis suggests that women's higher prevalence of sickness absence may be partly due to women having more household tasks and experiencing more conflict between work and family life than men [15].

Hannes et al. [44] interviewed sick-listed individuals who experienced a gradual opting out of other arenas to the point where life only revolved around working, fatigue and resting, finally resulting in sick leave. These findings are aligned with the results in the present study which indicated sick leave was needed to adjust the balance between self-care, family and recovery. These aspects were prioritised over work because sick leave is only possible in the work arena. Reducing a rewarding work role to compensate for demanding

personal lives might not be an optimal solution. However, withdrawal from the demands of the family role is difficult and may cause feelings of guilt, as well as pressure from others [21]. Hamnes et al. [44] also found that individuals chose to work fewer hours, worked part-time and attempted to reduce out of work stressors in order to achieve a better balance between work, family, social life and physical activity. This could be a similar, albeit more long-term, strategy as compared to the need for sick leave in the present study.

Participants had mixed feelings towards being on sick leave. Sick leave was experienced as necessary to improve their situation, but it also led to social avoidance behaviour and a feeling of being 'abnormal'. Working can be viewed as a signal to others that one is normal and beneficial to society [44]. Sustainable work participation is also closely linked to experiencing a meaningful life [45]. Disruption of roles that are important to one's self-image may cause individuals to feel 'lost' [21], and illness may lead to loss of self-image and social isolation [46]. This highlights the identity-bearing aspects of work as well as work as a social arena.

The sick role theory assumes that the withdrawal behaviour that is expected when on sick leave has an impact on all of the person's role performances and prevents the possibility to receive appreciation from other arenas [28]. Withdrawal behaviour may also lead to social isolation and restrict activities that could promote recovery [46]. For several in the present study, it was easier to avoid social situations which they felt required explanations for their participation. Behaviours that did not appear to promote their own well-being (e.g., socialising while being sick listed) may cause conflict to the expected behaviour of the sick role. This could be reinforced by having an illness invisible to their surroundings, making the decision to disclose their illness difficult and stressful, with the potential consequences of being rejected and stigmatised [47]. However, most individuals in the present study realised that lack of activity, social isolation and distancing themselves from their workplaces might obstruct their recovery and return to work. Withdrawing from work obligations may be experienced as necessary, but Parsons' theory of the sick role suggests that legitimate absence from work includes retreat from other roles [28]. Such total withdrawal is problematic as social isolation is a predictor of prolonged absence [48]. Return to work professionals may thus have an important role in reinforcing health promoting behaviours when such behaviours appear to contradict what is expected in the sick role.

Moreover, the social insurance system limits how long sick listed workers can withdraw from their work obligations. In Norway, sick listed workers are required to take part in work activities after eight weeks of absence or obtain an expanded medical certificate [35]. Parsons describe a moral obligation to overcome the sick role as soon as possible [28]. By demanding work activities, the system turns this moral obligation into a structural obligation, essentially deterring continuing withdrawal. For many sick listed in the present study, this was problematic as they experienced returning to work outside of their control. Thus, in order to find solutions and progress towards returning to work, participants needed assistance, for instance from the employer or their GP. In the present study, employers were largely willing to adjust work and facilitate graded leave, which can promote return to work [17]. However, not all reasons for absence were conveyed to the employer. For instance, proper adjustments may not be possible when absence is partly due to dissatisfaction with the job or stress due to childcare. Increased co-worker load due to sick listing, or a reason for sick leave that lacked apparent legitimacy, can create tension with colleagues [49]. On the other hand, communicating limitations reduces co-worker resentment [50]. Thus, there is a difficult trade-off in the balance of transparency and confidentiality when deciding how much to share. When experiencing a conflict between work and personal life, there is an imbalance in whether this conflict is deemed acceptable. Kelloway and Gottlieb [51] argued that keeping personal life out of the workplace is an established norm, thus spending time and effort on private roles while at work is rarely acceptable. On the other hand, thinking about work in private life or disrupting family plans, such as having to work late, is more acceptable [51].

Participants were apprehensive about prioritising their return to work, but rather viewed it as a consequence of better health or the resolution of their other challenges. Using graded leave enabled a balance between the benefits of returning to work and the fear of a worse situation due to returning to work. Re-entering work through graded leave helps the individual to comply with the competing expectations of both the sick role and the normality of everyday life. Returning to the workplace while still undergoing treatment, and before full recovery, has been described as important in returning to work [52]. Graded leave has also been shown to have a positive effect on return to work and sustainable work participation [53]. However, this may partly be due to health selection effects, as less healthy individuals might be unable to work at all [54].

Apart from assistance from healthcare services and ad-hoc employer assistance, participants had not experienced any structured return to work follow-up during the first few months of sick leave. This could be problematic for expedient return to work since other stakeholders see the GPs as a large contributor toward the patient's return to work, while the GPs view themselves primarily as advocates for their patients, their well-being and health [55]. Thus, there may not be a stakeholder present focusing on return to work at this stage. The Norwegian sickness insurance system offers 100% wage compensation for the first year, which might de-incentivise a faster return to work and make the system reliant on honesty and monitoring by the medical profession [26]. Those not receiving assistance from an employer may have an increased need for co-operation with social insurance caseworkers [36]. Particularly in cases where health services are unable to provide solutions to the health problems or other simultaneous challenges that individuals have in their work and personal domains. Similarly, employers may also lack knowledge on how to help their long-term sick employees and may also need support and training in providing efficient return to work assistance [56]. As adverse health outcomes and multimorbidity are associated with prolonged sick leave [3], individuals who cannot find a solution might be on a trajectory towards more serious situations. Prolonged absence may also change the sick leave experience from a necessary chance to rest into a negative circle of pain, inactivity and isolation [57]. As many of the participants in this study expected some form of contact with social insurance services, it might be useful for caseworkers to assist in order to facilitate and coordinate the return to work process among the sick-listed individual, their GP and their employer.

### ***Strengths and limitations***

A particular strength of this study is its descriptions of early sick leave using open-ended questions. Moreover, the data was analysed by researchers from varied backgrounds (psychology, sociology, medicine), contributing to diversity in analytical discussions. A possible limitation of this study is its low recruitment rate. In this qualitative study, we invited 73 of the participants in the RCT and 16 agreed to participate in interviews. This could have led to a selection bias where other kinds of experiences with sick leave are missing from our data. In addition, women and individuals with higher education may be overrepresented in the current sample. Having a more homogeneous sample or a different

gender balance could have resulted in other descriptions based on different experiences. Also, both interviewers were male with a psychology background, which could have affected interview responses. More variability in interviewers (gender, age, background) might have allowed other responses.

## **Conclusion**

Multiple simultaneous challenges regarding health issues, work- and personal stressors are experienced by sick listed workers even at an early stage of a potential long-term sick leave. When continuing sick leave is necessary to resolve these concerns, individuals on sick leave experience expectations that one should withdraw from society to focus on recovery. Such withdrawal is problematic for the identity and social life of sick listed individuals, and inactivity is often counter-productive for fast return to work. Sick listed workers thus face a difficult dilemma between returning to work to restore normal life and the perceived necessity of continuing sick leave. At this stage of sick leave healthcare services and employers are the main stakeholders involved in the return to work process. However, solutions to personal challenges may be outside the reach of these stakeholders. Thus, those individuals who are struggling to find solutions to their challenges could benefit from additional early follow-up that proactively examine work-related, social and personal factors that influence return to work.

## **List of abbreviations**

GP – General practitioner

NAV – Norwegian Labour and Welfare Administration

RCT – Randomised controlled trial

## **Acknowledgement and declarations**

### ***Ethics approval and consent to participate***

The study is approved by the Regional Committees for Medical and Health Research Ethics in South East Norway (No: 2016/2300). Written informed consent was obtained from all participants prior to interviews.

### ***Competing interests***

The authors declare that they have no competing interests.

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### ***Authors' contributions***

RH, LA, RJ, EAF designed the overall study. MIS, VSF, MS contributed to the design of the interview study. MIS was in charge of writing the article. All authors contributed to development of the interview guide. MIS and VSF did all interviews. MS supervised the data collection. MIS and VSF read and coded all interviews. RH, LA, RJ, EAF, MS read and coded two to four interviews each. All authors contributed in sessions on analysis and developing the results. All authors contributed to writing the article and approved the final version.

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### ***Data availability***



The datasets generated and analysed during the current study are not publicly available due to protecting the anonymity of participants.

## References

1. Gabbay M, Taylor L, Sheppard L, Hillage J, Bamba C, Ford F, et al. NICE guidance on long-term sickness and incapacity. *Br J Gen Pract.* 2011;61(584):118-24.  
<https://doi.org/10.3399/bjgp11X561221>
2. Gjesdal S, Ringdal PR, Haug K, Maeland JG. Predictors of disability pension in long-term sickness absence: results from a population-based and prospective study in Norway 1994-1999. *Eur J Public Health.* 2004;14(4):398-405.  
<https://doi.org/10.1093/eurpub/14.4.398>
3. Waddell G, Burton AK. *Is work good for your health and wellbeing?* London: The Stationery Office; 2006.
4. Black CM. *Working for a healthier tomorrow: Dame Carol Black's review of the health of Britain's working age population.* London: The Stationery Office; 2008.
5. Norwegian Ministry of Labour and Social Affairs. (2016). NAV i en ny tid – for arbeid og aktivitet. Meld. St. 33 (2015–2016). Retrieved from  
<https://www.regjeringen.no> Accessed 12.11.2018.
6. van Duijn M, Eijkemans MJ, Koes BW, Koopmanschap MA, Burton KA, Burdorf A. The effects of timing on the cost-effectiveness of interventions for workers on sick leave due to low back pain. 2010;67(11):744-50.  
<https://doi.org/10.1136/oem.2009.049874>
7. Aasdahl L, Fimland MS. Is there really a "golden hour" for work disability interventions? A narrative review. *Disabil Rehabil.* 2019:1-8.  
<https://doi.org/10.1080/09638288.2018.1503735>
8. Gragnano A, Negrini A, Miglioretti M, Corbière M. Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach. *J Occup Rehabil.* 2018;28(2):215-31.
9. Vogel N, Schandelmaier S, Zumbrunn T, Ebrahim S, de Boer WE, Busse JW, et al. Return-to-work coordination programmes for improving return to work in workers on

- sick leave. *Cochrane Database Syst Rev.* 2017;3:CD011618.  
<https://doi.org/10.1002/14651858.CD011618.pub2>
10. Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJ, Ostelo RW, Guzman J, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ.* 2015;350:h444.  
<https://doi.org/10.1136/bmj.h444>
  11. Hoefsmit N, Houkes I, Nijhuis FJ. Intervention characteristics that facilitate return to work after sickness absence: a systematic literature review. *J Occup Rehabil.* 2012;22(4):462-77. <https://doi.org/10.1007/s10926-012-9359-z>
  12. Aasdahl L, Pape K, Vasseljen O, Johnsen R, Gismervik S, Halsteinli V, et al. Effect of inpatient multicomponent occupational rehabilitation versus less comprehensive outpatient rehabilitation on sickness absence in persons with musculoskeletal- or mental health disorders: a randomized clinical trial. *J Occup Rehabil.* 2018;28(1):170-9. <https://doi.org/10.1007/s10926-017-9708-z>
  13. Cullen K, Irvin E, Collie A, Clay F, Gensby U, Jennings P, et al. Effectiveness of workplace interventions in return-to-work for musculoskeletal, pain-related and mental health conditions: an update of the evidence and messages for practitioners. *J Occup Rehabil.* 2018;28(1):1-15. <https://doi.org/10.1007/s10926-016-9690-x>
  14. Loisel P, Buchbinder R, Hazard R, Keller R, Scheel I, van Tulder M, et al. Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *J Occup Rehabil.* 2005;15(4):507-24. <https://doi.org/10.1007/s10926-005-8031-2>
  15. Nilsen W, Skipstein A, Ostby KA, Mykletun A. Examination of the double burden hypothesis—a systematic review of work-family conflict and sickness absence. *Eur J Public Health.* 2017;27(3):465-71. <https://doi.org/10.1093/eurpub/ckx054>
  16. Aronsson, G., et al., *A systematic review including meta-analysis of work environment and burnout symptoms.* *BMC Public Health*, 2017. **17**(1): p. 264.
  17. van Vilsteren M, van Oostrom SH, de Vet HC, Franche RL, Boot CR, Anema JR. Workplace interventions to prevent work disability in workers on sick leave. *Cochrane Database Syst Rev.* 2015;(10):CD006955.  
<https://doi:10.1002/14651858.CD006955.pub3>
  18. Nigatu, Y.T., et al., *Prognostic factors for return to work of employees with common mental disorders: a meta-analysis of cohort studies.* *Soc Psychiatry Psychiatr Epidemiol*, 2017. **52**(10): p. 1205-1215.

19. Landstad, B.J., C. Wendelborg, and M. Hedlund, *Factors explaining return to work for long-term sick workers in Norway*. Disability and Rehabilitation, 2009. **31**(15): p. 1215-1226.
20. Ford MT, Heinen BA, Langkamer KL. Work and family satisfaction and conflict: a meta-analysis of cross-domain relations. *J Appl Psychol*. 2007;92(1):57-80.  
<https://doi.org/10.1037/0021-9010.92.1.57>
21. Goode WJ. A theory of role strain. *Am Sociol Rev*. 1960;25(4):483-96.  
<https://doi.org/10.2307/2092933>
22. Corbiere M, Samson E, Negrini A, St-Arnaud L, Durand MJ, Coutu MF, et al. Factors perceived by employees regarding their sick leave due to depression. *Disabil Rehabil*. 2016;38(6):511-9. <https://doi.org/10.3109/09638288.2015.1046564>
23. Frederiksen P, Karsten MV, Indahl A, Bendix T. What challenges manual workers' ability to cope with back pain at work, and what influences their decision to call in sick? *J Occup Rehab*. 2015;25(4):707-16. <https://doi.org/10.1007/s10926-015-9578-1>
24. Brataas HV, Evensen AE. Life stories of people on sick leave from work because of mild mental illness, pain and fatigue. *Work*. 2016;53(2):285-91.  
<https://doi.org/10.3233/WOR-152106>
25. Sandmark H, Renstig M. Understanding long-term sick leave in female white-collar workers with burnout and stress-related diagnoses: a qualitative study. *BMC Public Health*. 2010;10(1):210. <https://doi.org/10.1186/1471-2458-10-210>
26. Bratberg E, Dahl SÅ, Risa AE. 'The double burden': do combinations of career and family obligations increase sickness absence among women? *Eur Sociol Rev*. 2002;18(2):233-49.
27. Parsons T. *The social system*. 2nd ed. London: Routledge; 1991. X. Social structure and dynamic process: The case of modern medical practice p. 428-479.
28. Varul MZ. Talcott Parsons, the sick role and chronic illness. *Body Soc*. 2010;16(2):72-94. <https://doi.org/10.1177%2F1357034X10364766>
29. Gahnstrom-Strandqvist K, Liukko A, Tham K. The meaning of the working cooperative for persons with long-term mental illness: a phenomenological study. *Am J Occup Ther*. 2003;57(3):262-72. <https://doi.org/10.5014/ajot.57.3.262>
30. Blank AA, Harries P, Reynolds F. 'Without occupation you don't exist': occupational engagement and mental illness. *J Occup Sci*. 2015;22(2):197-209.  
<https://doi.org/10.1080/14427591.2014.882250>

31. Lannerstrom L, Wallman T, Holmstrom IK. Losing independence—the lived experience of being long-term sick-listed. *BMC Public Health*. 2013;13:745. <https://doi.org/10.1186/1471-2458-13-745>
32. Ahlstrom L, Dellve L, Hagberg M, Ahlberg K. Women with neck pain on long-term sick leave—approaches used in the return to work process: a qualitative study. *J Occup Rehabil*. 2017;27(1):92-105. <https://dx.doi.org/10.1007%2Fs10926-016-9636-3>
33. Elderkin-Thompson V, Waitzkin H. Differences in clinical communication by gender. *J Gen Intern Med*. 1999;14(2):112-21. <https://psycnet.apa.org/doi/10.1046/j.1525-1497.1999.00296.x>
34. McInnis OA, McQuaid RJ, Bombay A, Matheson K, Anisman H. Finding benefit in stressful uncertain circumstances: relations to social support and stigma among women with unexplained illnesses. *Stress*. 2015;18(2):169-77. <https://doi.org/10.3109/10253890.2014.1001975>
35. Hankivsky O. Women's health, men's health, and gender and health: implications of intersectionality. *Soc Sci Med*. 2012;74(11):1712-20. <https://doi.org/10.1016/j.socscimed.2011.11.029>
36. Eftedal M, Kvaal AM, Ree E, Oyeflaten I, Maeland S. How do occupational rehabilitation clinicians approach participants on long-term sick leave in order to facilitate return to work? A focus group study. *BMC Health Serv Res*. 2017;17(1):744. <https://doi.org/10.1186/s12913-017-2709-y>
37. Aasdahl L, Foldal VS, Standal MI, Hagen R, Johnsen R, Solbjør M, et al. Motivational interviewing in long-term sickness absence: study protocol of a randomized controlled trial followed by qualitative and economic studies. *BMC Public Health*. 2018;18(1):756. <https://doi.org/10.1186/s12889-018-5686-0>
38. NAV (2019). Sykepenger til arbeidstakere. Retrieved from <https://www.nav.no/no/Person/Arbeid/Sykmeldt%2C+arbeidsavklaringspenger+og+yrkesskade/Sykepenger/Sykepenger+til+arbeidstakere> Accessed 04.11.2019.
39. NAV (2019). Avtalepunkter og frister i sykefraværsoppfølgingen. Retrieved from <https://www.nav.no/no/Bedrift/Oppfolging/Sykmeldt+arbeidstaker/Relatert+informasjon/oppfolging-av-sykmeldte-arbeidstakere?kap=394789> Accessed 04.11.2019
40. Malterud K, Siersma VD, Guassora AD. Sample size in qualitative interview studies: guided by information power. *Qual Health Res*. 2016;26(13):1753-60. <https://doi.org/10.1177/1049732315617444>

41. Giorgi A. The descriptive phenomenological method in psychology: a modified Husserlian approach. Pittsburgh, PA: Duquesne University Press; 2009.
42. Evans P, Bartolomé F. The changing pictures of the relationship between career and family. *J Organ Behav*. 1984;5(1):9-21. <https://doi.org/10.1002/job.4030050103>
43. Kosny A, Newnam S, Collie A. Family matters: compensable injury and the effect on family. *Disabil Rehabil*. 2018;40(8):935-44. <https://doi.org/10.1080/09638288.2017.1283450>
44. Hamnes B, Ronningen A, Skarbo A. Experiences of participating in return-to-work group programmes for people with musculoskeletal disorders: a focus group study. *Musculoskeletal Care*. 2017;15(3):272-80. <https://doi.org/10.1002/msc.1210>
45. Klevanger NE, Fimland MS, Johnsen R, Rise MB. Unfolding the values of work - therapists experience of addressing the return to work process in occupational rehabilitation based on Acceptance and Commitment Therapy. *BMC Health Serv Res*. 2018;18(1):303. <https://doi.org/10.1186/s12913-018-3035-8>
46. Charmaz K. Loss of self: a fundamental form of suffering in the chronically ill. *Sociol Health Illn*. 1983;5(2):168-95. <https://doi.org/10.1111/1467-9566.ep10491512>
47. Joachim G, Acorn S. Stigma of visible and invisible chronic conditions. *J Adv Nurs*. 2000;32(1):243-8. <https://doi.org/10.1046/j.1365-2648.2000.01466.x>
48. Steenstra IA, Verbeek JH, Heymans MW, Bongers PM. Prognostic factors for duration of sick leave in patients sick listed with acute low back pain: a systematic review of the literature. *Occup Environ Med*. 2005;62(12):851-860. <https://doi:10.1136/oem.2004.015842>
49. Tjulin A, MacEachen E, Stiwne EE, Ekberg K. The social interaction of return to work explored from co-workers experiences. *Disabil Rehabil*. 2011;33(21-22):1979-89. <https://doi.org/10.3109/09638288.2011.553708>
50. Skivington K, Lifshen M, Mustard C. Implementing a collaborative return-to-work program: lessons from a qualitative study in a large Canadian healthcare organization. *Work*. 2016;55(3):613-24. <https://doi.org/10.3233/WOR-162437>
51. Kelloway EK, Gottlieb BH, Barham L. The source, nature, and direction of work and family conflict: a longitudinal investigation. *J Occup Health Psychol*. 1999;4(4):337-46. <https://doi.org/10.1037/1076-8998.4.4.337>
52. MacEachen E, Clarke J, Franche RL, Irvin E. Systematic review of the qualitative literature on return to work after injury. *Scand J Work Environ Health*. 2006;32(4):257-269. <https://doi.org/10.5271/sjweh.1009>

53. Markussen S, Mykletun A, Røed K. The case for presenteeism — evidence from Norway's sickness insurance program. *J Public Econ*. 2012;96(11-12):959-72. <https://doi.org/10.1016/j.jpubeco.2012.08.008>
54. Nossen JP, Brage S. Effekt av gradert sykmelding – betydningen av metodevalg. *Arbeid og velferd*. 2013;3.
55. Mazza D, Brijnath B, Singh N, Kosny A, Ruseckaite R, Collie A. General practitioners and sickness certification for injury in Australia. *BMC Fam Pract*. 2015;16:100. <https://doi.org/10.1186/s12875-015-0307-9>
56. Spector, J. & Reul, N. K. (2017). Promoting Early, Safe Return to Work in Injured Employees: A Randomized Trial of a Supervisor Training Intervention in a Healthcare Setting. *J Occup Rehab*. 2017;27(1):70-81. <https://doi.org/10.1007/s10926-016-9633-6>
57. Ockander M, Timpka T. A female lay perspective on the establishment of long-term sickness absence. *Int J Soc Welf*. 2001;10(1):74-9. <https://doi.org/10.1111/1468-2397.00154>

Table 1 - Participants descriptive information.

Participant	Age	Gender	Self-reported illness	Education	Sector
<b>1</b>	31-40	Female	CMD	Higher (>3y)	Public
<b>2</b>	31-40	Male	CMD	Higher (3y)	Private
<b>3</b>	51-60	Female	MSK	Trade school	Private
<b>4</b>	31-40	Female	CMD	Higher (3y)	Public
<b>5</b>	31-40	Female	CMD	Higher (>3y)	Public
<b>6</b>	41-50	Male	Other	Higher (>3y)	Private
<b>7</b>	51-60	Female	MSK	Higher (3y)	Public
<b>8</b>	51-60	Female	CMD	Higher (>3y)	Public
<b>9</b>	41-50	Male	MSK	Higher (>3y)	Private
<b>10</b>	51-60	Female	CMD	Trade school	Private
<b>11</b>	31-40	Female	CMD	Higher (>3y)	Public
<b>12</b>	Missing	Female	CMD	Missing	Public
<b>13</b>	41-50	Female	Other	High school	Public
<b>14</b>	41-50	Female	CMD	Higher (>3y)	Public
<b>15</b>	41-50	Female	CMD	Higher (>3y)	Private
<b>16</b>	51-60	Female	Other	Higher (3y)	Private

*CMD: Common mental disorder. MSK: Musculoskeletal disorder.*

*Education is described as the participant's highest completed education (higher education is at the university/college level).*

Table 2 – Interview guide.

Could you tell us about being on sick leave?

Could you tell us about the assistance that you have received during your sick leave?

What are your thoughts about returning to work?

What motivates you to return to work?

What is it like talking about being on sick leave?



Table 3 - Example of analysis process.

<p><b>Step 1 – An overview</b></p> <p>This individual is struggling with a demanding job, an illness that does not have a clear diagnosis and prognosis and a lack of energy available for personal life.</p>
<p><b>Step 2 – Creating meaning units</b></p> <p>Being able to take a step back and recover and not have to go ‘all-in’. That I can relax at home and ... gather energy until the kid comes home and I can spend the energy playing with him. Because just lying on the couch when he wants to play with you and you just doesn’t have the energy to do it. It’s really a stab in the heart.</p> <p>///</p> <p>And we didn’t really do anything either. I didn’t have the energy to get out of the house. So now there’s more I want to do, even though I can’t do everything.</p>
<p><b>Step 3 – Transforming the meaning units to generalised expressions</b></p> <p>This individual feels (s)he has been able to recover energy that (s)he can spend with the child when on sick leave.</p>
<p><b>Step 4 – Developing themes</b></p> <p>Energy depleted – work-family conflict</p>



# Paper II



## **Subgroups of long-term sick-listed based on prognostic return to work factors across diagnoses – A cross-sectional latent class analysis**

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### ***Conflicts of interest***

Authors Martin Inge Standal, Lene Aasdahl, Chris Jensen, Vegard Stolsmo Foldal, Roger Hagen, Egil A. Fors, Marit Solbjør, Odin Hjemdal, Margreth Grotle, and Ingebrigt Meisingset declare that they have no conflict of interest.

### ***Ethics approval***

The study was approved by the Regional Committee for Medical and Health Research Ethics in South East Norway (No: 2016/2300).

### ***Consent***

Written informed consent was obtained from all participants.

### ***Data availability***

The datasets generated and analysed during the current study are not publicly available due to protecting the anonymity of participants.

### ***Authors contributions***

Conceptualization was performed by Martin Inge Standal, Margreth Grotle, Ingebrigt Meisingset and Roger Hagen; Data material preparation by Egil A. Fors, Roger Hagen, Lene Aasdahl, Marit Solbjør, Odin Hjemdal, Martin Inge Standal and Vegard Stolsmo Foldal; Data

collection by Egil A. Fors, Roger Hagen, Lene Aasdahl, Marit Solbjør, Vegard Stolsmo Foldal and Martin Inge Standal; Variable selection by all authors; Latent class analysis by Martin Inge Standal and Ingebrigt Meisingset; Substantive interpretation of classes by all authors. First draft by Martin Inge Standal; Draft revision by all authors. All authors read and approved of the final manuscript.

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## **Title**

Subgroups of long-term sick-listed based on prognostic return to work factors across diagnoses – A cross-sectional latent class analysis

## **Abstract**

**Purpose:** Comorbidity is common among long-term sick-listed and many prognostic factors for return to work (RTW) are shared across diagnoses. RTW interventions have small effects, possibly due to being averaged across heterogeneous samples. Identifying subgroups based on prognostic RTW factors independent of diagnoses might help stratify interventions.

The aim of this study was to identify and describe subgroups of long-term sick-listed workers, independent of diagnoses, based on prognostic factors for RTW.

**Methods:** Latent class analysis of 532 workers sick-listed for eight weeks was used to identify subgroups based on seven prognostic RTW factors (self-reported health, anxiety and depressive symptoms, pain, self-efficacy, work ability, RTW expectations) and four covariates (age, gender, education, physical work).

**Results:** Four classes were identified: Class 1 (45% of participants) was characterized by favorable scores on the prognostic factors; Class 2 (22%) by high anxiety and depressive symptoms, younger age and higher education; Class 3 (16%) by overall poor scores including high pain levels; Class 4 (17%) by physical work and lack of workplace adjustments. Class 2 included more individuals with a psychological diagnosis, while diagnoses were distributed more proportionate to the sample in the other classes.

**Conclusions:** The identified classes illustrate common subgroups of RTW prognosis among long-term sick-listed individuals largely independent of diagnosis. These classes could in the future assist RTW services to provide appropriate type and extent of follow-up, however more research is needed to validate the class structure and examine how these classes predict outcomes and respond to interventions.

**Key words:** sick leave, return to work, vocational rehabilitation, common mental disorder, pain.



## **Background**

Prolonged sickness absence is costly for society and associated with adverse health outcomes and comorbidity for the individual [1]. In order to help individuals return to work (RTW) effective vocational rehabilitation interventions are required as healthcare treatment alone has little impact on work outcomes [2]. However, the results of such interventions are inconclusive [3-6]. The variation in effectiveness found in RTW interventions could partly be due to the effects being averaged across heterogeneous samples, meaning some subgroups will have no benefit or possibly even experience negative outcomes of these interventions [7]. Diagnosis is also often used as basis for recruitment into such interventions, even though diagnosis provides limited information of the complexity and interrelationship between factors associated with prognosis [8, 9]. For example, musculoskeletal and psychological disorders, the most prevalent diagnoses for loss of work days in Norway [10] and major causes of disability worldwide [11], have considerable comorbidity and several shared prognostic factors for RTW [12-16]. In addition, patterns of relapse between RTW and sick leave are common for both of these diagnostic categories [17, 18]. An alternative approach could be using known factors that influence RTW for early identification of subgroups at risk of prolonged sick leave, regardless of diagnosis.

Identifying subgroups that can be used to stratify care is challenging and has been a focus of research in some fields for many years [19], mainly in patients with musculoskeletal disorders [20-23]. Such stratification approaches have shown effective in treatment of patients with low back pain [24]. However, few studies have attempted to identify subgroups based on prognostic RTW factors independent of diagnoses. One recent study identified subgroups of unemployed sick-listed individuals based on their predicted risk of long-term sickness absence and found four groups characterized by negative RTW expectations, positive RTW expectations, mental limitations and physical limitations [25]. Such research is still lacking for those with an employment contract. As many social insurance and healthcare professionals serve varied user groups, identifying homogeneous subgroups independent of diagnosis could assist these services to channel resources towards those who may benefit the most [26].

The aim of the present study was to identify and describe subgroups of long-term sick-listed workers, independent of diagnoses, based on prognostic factors for RTW. In particular, we wanted to investigate the following research questions:

1. What characterizes subgroups of long-term sick listed workers, independent of diagnoses, based on prognostic factors?
2. How are the psychological and musculoskeletal diagnostic categories distributed within these subgroups?

## **Methods**

### ***Study design***

This cross-sectional study used data from a cohort of sick-listed workers in an ongoing randomized controlled trial [27]. All data in the present study were collected at inclusion in the trial, prior to randomization. The study was approved by the Regional Committee for Medical and Health Research Ethics in South East Norway (No: 2016/2300). Written informed consent was obtained from all participants.

### ***Study setting***

In Norway, employees are entitled to 12 months of full wage benefits when on sick leave. For the first 16 days of sick leave wages are paid by the employer, while the remaining year is paid for by the National Insurance Scheme through the Norwegian Labour and Welfare Administration (NAV) [28].

### ***Participants and recruitment***

Participants in the present study were employed workers aged 18-62 on sick leave for eight weeks the previous six months, with a current sick leave status of 50-100%. Eligible participants living in Trondheim, Central Norway, were invited via NAV's electronic communication site. Data from participants included in the trial from August 2017 to October 2019 were used in the present study. In this period 4708 individuals were invited, of which 709 (15%) accepted and received a questionnaire by e-mail at eight weeks of sick leave. This questionnaire was answered by 571 (81%) of the included participants.

### ***Measurement instruments***

The questionnaire included questions related to sociodemographic characteristics, symptoms and health, and work-related factors. Variables were selected a priori based on a literature search of reviews on prognostic factors for RTW. Factors such as perceived health [29], symptom severity [13], and the possibility of workplace adjustments are predictors for prolonged sick leave [30, 31]. Furthermore, factors such as RTW self-efficacy [15], perceived work ability and RTW expectations have also been shown to be important for RTW [13, 32]. Common sociodemographic factors are age, education, gender, and the physical demands of one's work [13, 16, 32]. In addition, information on participants' current diagnosis was obtained from NAV.

### *Sociodemographic characteristics*

Sociodemographic factors included age, gender, educational level and the physical demands of the participants' work. Age was scored as a continuous variable. Education was dichotomized as higher (completed minimum three years of college/university) or lower. Participants were asked how physically demanding their job was by describing their work using the categories "Mostly sedentary work", "Work that demand that you walk a lot", "Work where you walk and lift a lot", "Heavy manual labour", and "Do not know / unsure". This variable was dichotomized (physically demanding work or not) by combining the two less demanding categories and the two more demanding categories. "Do not know / unsure" was set to missing ( $n = 18$ ).

### *Symptoms and Health*

Anxiety was assessed using the Generalized Anxiety Disorder-7 questionnaire [33], and depression with the Patient Health Questionnaire-9 [34]. Anxiety and depression scores were combined into the Patient Health Questionnaire Anxiety and Depression Scale (PHQ-ADS), which has shown to be a valid and reliable composite measure of depression and anxiety [35]. The PHQ-ADS was used to assess anxiety and depression symptoms on a scale from 0-48, where 0 indicate low levels of symptoms and 48 indicate high levels of symptoms.

Pain intensity was assessed by an item from the Brief Pain Inventory [36, 37] querying participants to "Describe your average pain intensity the last week" on a scale from 0 (no pain at all) to 10 (worst possible pain).

To detect individuals who may have had other health issues besides anxiety, depression or pain, we included the EQ-VAS analog scale from the EQ-5D-5L questionnaire [38]. This question asks participants to rate their current health on a scale from 0-100 (0 being worst possible health and 100 being best possible health) and was used to assess general health status.

### *Work related factors*

Workplace adjustment latitude was examined with the question “To what degree do you feel your workplace facilitates work adjustments?”. Response options ranged from 1 (to a very low degree) to 10 (to a very high degree).

Self-reported work ability was measured using the work ability score (WAS), which is an item from the Work Ability Index [39]. WAS asks participants about their “current work ability compared with lifetime best” on a scale from 0 (completely unable to work) to 10 (work ability at its best). WAS has been shown to be a good alternative to using the full index [40, 41].

Work related self-efficacy was measured using an 11-item RTW-SE scale [42]. The scale has 11 questions on expectations of working if the participants were to imagine being back to work tomorrow. The scale ranges from 0 “totally disagree” to 5 “totally agree”. An average score of the 11 items was used.

Return-to-work expectations was measured by the question “Starting today, how many months do you believe you will be sick-listed?”. Answers greater than 12 months ( $n = 14$ ) were set to 12 months, as individuals need to apply for more long-term benefits after 12 months [43].

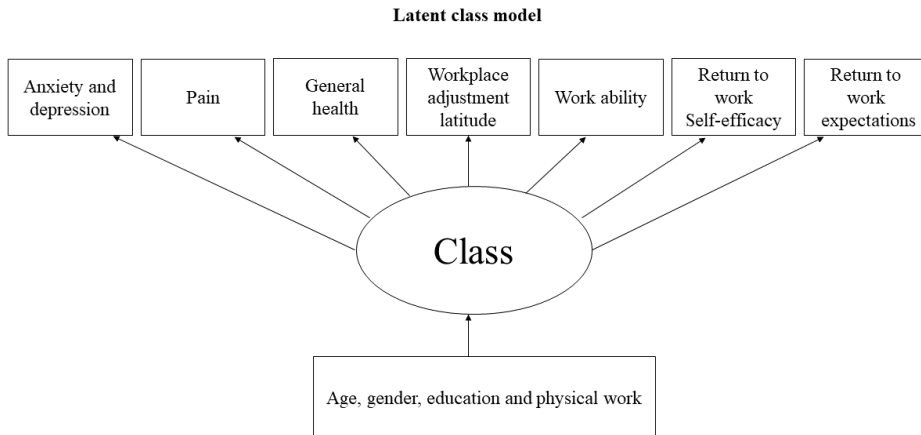
### *Diagnosis*

Diagnosis was retrieved from the sick leave certificate and obtained from NAV. Diagnosis is usually set by the individual’s general practitioner, using the International Classification of Primary Care (ICPC-2) [44]. Diagnoses were categorized as “Musculoskeletal” (ICPC-2 L), “Psychological” (ICPC-2 P), or “Other” (containing all other diagnoses).

### ***Statistical analysis***

Latent class analysis (LCA) was used to identify classes of sick-listed individuals based on their scoring on the prognostic RTW factors. LCA attempts to identify subgroups, or classes, of individuals who share common characteristics and are as distinct as possible from the other identified subgroups [45]. LCA is a cluster analysis method that has some advantages over traditional techniques. For example, LCA can produce statistical information about model fit that can help guide model selection [46]. The method is also flexible and can be used with different types of data, allows for different subgroup distributions (i.e., shape, size, and orientation), and handles missing values well [46, 47].

The seven a priori chosen prognostic factors included as indicators in the LCA model were anxiety and depression, pain, general health, work ability, workplace adjustment latitude, return to work self-efficacy, and return to work expectations. The sociodemographic variables age, gender, educational level and physically demanding work were included as active covariates in the model (see Fig. 1).



***Fig. 1*** Latent class model. Indicator variables (anxiety and depression, pain, health, workplace adjustment latitude, work ability, return to work self-efficacy, and return to work expectations) and covariates (age, gender, education and physically demanding work)

The LCA was performed using an iterative approach starting with a model with a one-class solution and continuing up to seven classes. Model fit was assessed using the adjusted Bayesian Information Criteria (aBIC) [48] as it has been shown to be the most accurate information criteria in simulation [49]. The optimal number of classes was decided based on a combination of aBIC and substantive interpretation (i.e. if the classes are distinct and have practical meaning based on the scoring on the prognostic factors). Based on the scoring patterns, the LCA estimated posterior probabilities for inclusion into each class for each individual, and the participants were assigned to the class where they had the highest posterior probability. A posterior probability above 0.7 is recommended, and 0.9 is suggested as good when assessing uncertainty of the class assignment [50].

We tested several model specifications as suggested by Masyn [51]. First, by allowing (or not allowing) class variances to be unequal across the latent classes. Secondly by relaxing the assumption of local independence by allowing (or not allowing) indicator variables to covary within a class. For the most unrestricted model we then examined the covariance matrices for the indicator residuals in each class and identified pairs of variables whose residuals were significantly associated within a class ( $p < 0.05$ ), indicating local dependence [52]. We then relaxed the assumption of local independence only where local dependence was indicated. For each model, a minimum of 200 random draws were performed in order to achieve an optimal model. After latent class modelling had been performed, we also examined the prevalence of the diagnosis categories within each class.

All analyses were performed using Stata 15.1 (StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC).

## **Results**

### ***Sample description***

The final sample ( $n = 532$ ) consisted of 65% women, 65% had higher education and the mean age was 44 years (SD 9.8). The mean symptom scores indicated mild anxiety and depressive symptoms (15.8 SD 10.2) [35], and mild to moderate pain intensity (4.3 SD 2.7) [53]. The mean work ability of 3.5 (SD 2.7) can be described as “poor” [41]. Diagnoses were split by about a third for musculoskeletal (37%), psychological (32%), and all other diagnoses (31%). See Table 2 and Figure 3 for additional characteristics.

### ***Model selection***

The more unrestricted models generally had better model fit compared to the more restrictive models (see Table 1). The chosen model specification which presented the best fit included class-varying variances, as well as relaxation of the assumption of local independence for those variables that were found to covary within a class (Model 5 in Table 1). The five-class model presented the lowest aBIC and this model and those with  $\pm$  one class were further examined. The four and the five class models showed similar patterns, however the four-class solution was selected based on the interpretation of practical meaning and simplicity. Posterior probabilities were generated for 532 participants, meaning 39 participants had too many missing values to be classified. The average posterior probabilities of class membership in the final model were 0.90, 0.83, 0.90 and 0.88 in Class 1-4 respectively which indicated that subjects were classified with low uncertainty.

**Table 1 – Model fit (adjusted Bayesian Information Criteria) for the latent class models**

<b>Classes</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>1</b>	19920	19920	19382	19382	19376
<b>2</b>	19536	19360	19285	19075	19039
<b>3</b>	19419	19187	19042	19023	18994
<b>4</b>	19200	19090	19011	18974	18917
<b>5</b>	19144	18988	19002	18951	18898
<b>6</b>	19122	18950	19009	18959	18908
<b>7</b>	19093	18937	N/A*	19010	18911

*Lower fit indices indicate a better-fitting model. **Model 1:** Class-invariant variances, diagonal covariances between indicator variables within classes. **Model 2:** Class-varying variances, diagonal indicator covariances. **Model 3:** Class-invariant variances, unrestricted indicator covariances (\* The 7-class model failed to reliably converge). **Model 4:** Class-varying variances, unrestricted indicator covariances. **Model 5:** Class-varying variances, unrestricted indicator covariances where local dependence was indicated.*

### ***Class prevalence and characterization***

Table 2 describes the characteristics of the four classes and normalized class profiles can be found in Figure 2. The first and largest class (45%,  $n = 240$ ) was indicative of individuals who had low symptom scores, high RTW self-efficacy and high work ability. Class 2 included 22% ( $n = 114$ ) of participants and had the highest level of anxiety and depression symptoms, poorest self-efficacy as well as younger age, less physically demanding work and higher education. The third class included 16% ( $n = 87$ ) of participants and consisted of those with poor scores on several of the prognostic variables, including higher levels of pain, and anxiety and depressive symptoms. They also more frequently had lower education and physically demanding work. Further, individuals in Class 3 expected to be sick listed longer than the other classes. Class 4 included 17% ( $n = 91$ ) of the participants and was characterized by moderately high pain and anxiety and depressive symptoms. Similar to Class 3, subjects in Class 4 more frequently had a physically demanding job than the sample mean, but Class 4 was also characterized by poor possibilities for workplace adjustments.

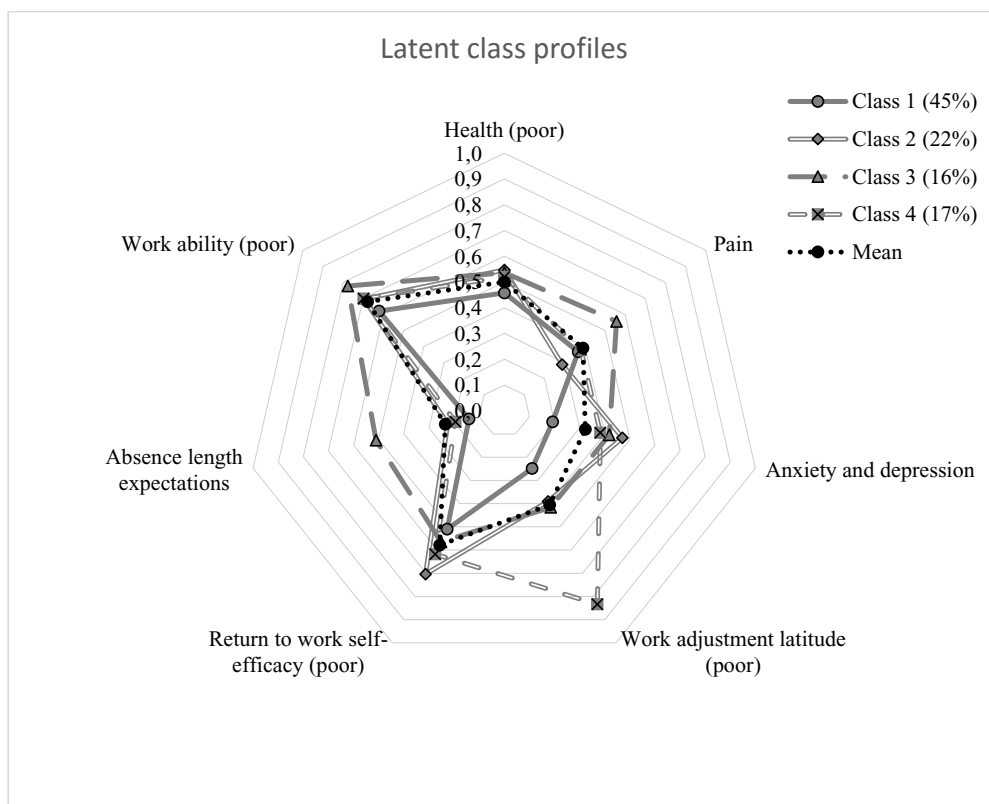
**Table 2 – Characteristics of the overall sample and classes (values given are mean (SD), unless otherwise stated).**

Variable (Full range)	Sample $n = 532$	Class 1 $n = 240$ (45%)	Class 2 $n = 114$ (22%)	Class 3 $n = 87$ (16%)	Class 4 $n = 91$ (17%)
<b>Age (18-62 years)</b>	44 (10)	46 (9)	39 (9)	45 (10)	45 (10)
<b>Gender (female) – <math>n</math> (%)</b>	351 (66%)	160 (67%)	81 (71%)	56 (64%)	54 (59%)
<b>Education (higher) – <math>n</math> (%)</b>	351 (66%)	175 (73%)	98 (86%)	31 (36%)	47 (52%)
<b>Physically demanding work (more) – <math>n</math> (%)</b>	179 (34%)	67 (28%)	13 (11%)	49 (56%)	50 (55%)
<b>Self-reported health (0-100)</b>	50.4 (20.5)	54.3 (20.9)	45.0 (18.1)	48.8 (23.3)	49.1 (18.0)
<b>Pain intensity (0-10)</b>	4.3 (2.7)	4.1 (2.6)	3.1 (2.6)	6.1 (2.1)	4.2 (2.5)
<b>Anxiety and depressive symptoms (0-48)</b>	15.8 (10.1)	9.1 (5.0)	23.8 (7.7)	20.7 (10.9)	18.5 (10.7)
<b>Work ability (0-10)</b>	3.5 (2.6)	4.1 (2.9)	3.4 (2.1)	2.4 (2.3)	3.4 (2.6)
<b>Workplace adjustment latitude (1-10)</b>	6.0 (3.0)	7.6 (2.0)	6.0 (2.2)	5.8 (3.0)	1.7 (0.7)
<b>Return to work self-efficacy (0-5)</b>	2.5 (1.1)	2.9 (1.0)	1.8 (0.7)	2.6 (1.1)	2.3 (1.1)



<b>Expected sickness absence length (0-12 months)</b>	3.0 (2.7)	1.8 (1.2)	3.0 (0.7)	6.9 (3.7)	2.2 (1.6)
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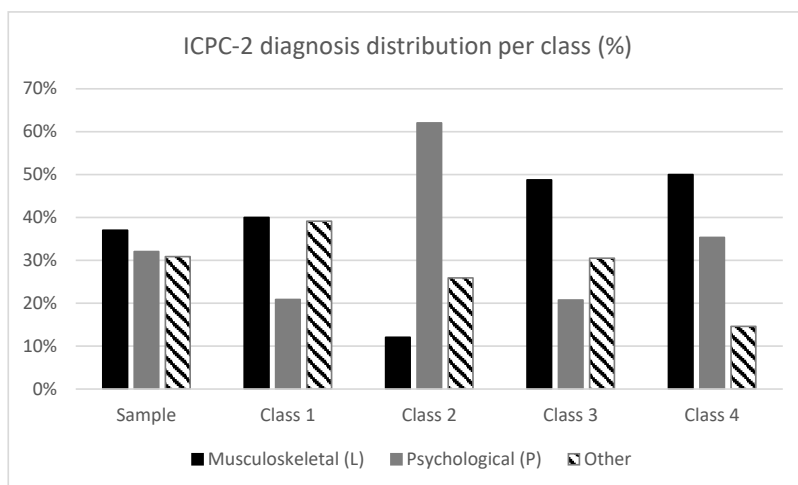
**Education:** Percentage of individuals that have completed a minimum of three years of higher education at the college or university level. **Physically demanding work:** Percentage of individuals that rate their work as “demanding a lot of walking and lifting” or “heavy manual labour”. **Self-reported health:** Higher number indicate better health. **Pain intensity:** Higher number indicate more pain. **Anxiety and depressive symptoms:** Higher number indicate more symptoms. **Workplace adjustment latitude:** Higher number indicate greater possibility for work adjustment. **Return to work self-efficacy:** Higher number indicate greater self-efficacy.



**Fig. 2** Normalized class profiles. Variables are normalized on a scale from 0-1, where 1 indicates poorer scores. In this representation, mean scores were divided by the variable’s full range and reversed where higher numbers originally indicated favorable scores.

## Diagnosis

Figure 3 describes the distribution of the diagnosis categories in the sample and classes. Participants with a psychological diagnosis was to a greater degree grouped into Class 2 (62%). Those with musculoskeletal diagnoses were more evenly distributed between Class 1 (40%), Class 3 (49%) and Class 4 (50%). Similarly, “Other” diagnoses were less frequently placed in Class 4 (15%), but more evenly distributed among the other classes. Diagnosis was missing for 30 participants in the final model.



**Fig. 3** Distribution of diagnostic groups based on ICPC-2 diagnoses set by the worker’s general practitioner. Percentages within each class and in the total sample.

## Discussion

This cross-sectional study identified four classes of sick-listed individuals based on seven prognostic RTW factors and four covariates. The four classes were characterized by distinct patterns across prognostic RTW factors, largely independent of sick leave diagnosis.

Previous research has attempted to define more homogeneous patient subgroups with the goal of reducing complexity and simplifying treatment options [54]. These endeavors have frequently been based on individual characteristics such as symptoms, pain sites, or other prognostic factors, and usually within defined patient groups. Previous studies have found subgroups that differ in severity [55-57], or subgroups that are qualitatively distinct,

for example in symptoms or personal factors [22, 58-60]. For instance, studies using prognostic factors have found subgroups characterized by low risk, mental health issues, physical limitations and pain, and workplace related concerns in patients with musculoskeletal disorders [61, 62]. The present study adds to the previous literature by grouping individuals regardless of sick leave diagnosis into comparable subgroups that differ both in severity (i.e. most favorable scores on RTW predictors in Class 1, medium in Class 2 and Class 4, and poorest scores in Class 3) and qualitatively (e.g. mental health issues and workplace factors in Class 2 and 4, respectively). The findings suggest that sick-listed individuals can be classified based on prognostic factors rather than diagnosis in an RTW context. A cross-disease approach in the RTW process has also previously been advocated [13].

### ***Implications for practice***

Identification of those at risk (or not at risk) for prolonged sick leave is important for both social insurance and vocational rehabilitation services in order to create plans for RTW [63]. This is important in order to design rehabilitation services and to allocate appropriate resources based on the expected prevalence of a risk group. Screening to identify and provide additional care to high risk groups with musculoskeletal disorders has shown to reduce time off work for these groups [24].

Class 1, with almost half of the participants, was characterized by advantageous scores on several of the prognostic RTW factors compared to the other classes. Identifying those with good prognosis may be useful in order to avoid excessive assistance (overtreatment) for these individuals [64], which may even delay RTW [65]. However, further research is needed to determine whether individuals in Class 1 have a favorable RTW prognosis.

Class 2 was characterized by younger age, anxiety and depressive symptoms, and poor RTW self-efficacy. Furthermore, Class 2 had a higher prevalence of individuals with a psychological diagnosis compared to the other classes. These characteristics indicate that work-focused cognitive therapies that could help promote self-efficacy could be useful for such a group [66, 67]. However, the mean scores for anxiety and depressive symptoms were similar in Class 3 and Class 4. This indicate that anxiety and depression symptoms were

common for those with poorer prognostic scores (Class 2-4) in the present study regardless of the prevalence of psychological diagnoses in the classes.

Class 3 was characterized by individuals who generally scored poorly on many of the prognostic RTW factors. Individuals in this class reported both pain and mental health symptoms, but more often had a musculoskeletal diagnosis than a psychological diagnosis. For those experiencing chronic pain, research has emphasized that psychosocial factors, such as fear-avoidance beliefs and psychological distress, are associated with poor outcomes [68]. Such factors are common in the first few months after injury [69] but may not always be identified when seeking help for physical symptoms [70]. Previous cluster analyses of musculoskeletal patients have also identified psychologically distressed subgroups [22, 60, 62, 71], which could be similar to Class 3 in the present study. Such groups may benefit from broader interventions also focusing on coping, problem solving, and other psychosocial factors [4, 72, 73].

Class 4 was characterized by physically demanding work in combination with poor possibilities of workplace adjustments. Although some work tasks are difficult to accommodate to individual employees, Class 4 may still indicate a proportion of sick-listed workers where workplace interventions could be sought in order to facilitate RTW as work adjustments are important for RTW [16, 31]. Where adjustments are difficult, interventions could address other aspects of the workplace, such as supervisor support, disability management practices, and workplace culture [71, 73]. Some of those experiencing low adjustment latitude after illness may also need help or encouragement in finding a more suitable job. Job changes can be a solution to ill health in order to avoid movement out of employment [74].

In patients with back pain, using risk factors to identify subgroups led to the development of the PRICE tool [61, 62, 71, 75]. The PRICE tool can be used to identify those with poor prognosis for RTW and also indicates where assistance should be focused (e.g., the workplace, psychological coping, physical activation) for this patient population [75]. The present study indicated similar subgroups independent of diagnoses as those described in the aforementioned studies, which supports the relevance of our subgrouping approach. The identified subgroups may indicate typical barriers to RTW at this stage of sick leave. Such groups could be used, for instance by social insurance workers who serve a diagnostically varied user group, as a starting point to identify problem areas that could be the

focus for vocational rehabilitation interventions. For the present findings, however, further research is needed to examine the practical relevance of prognostic subgrouping across diagnoses. Identification of subgroups based on risk of prolonged sick leave may be useful in itself if the predictive validity of the classes is acceptable. However, it does not necessarily follow that such subgroups respond to interventions. Matching interventions to prognostic risk factors can be difficult and has previously been found to be lacking in practice [73]. Furthermore, investigations of intervention effects for such subgroups require separate carefully designed studies [76].

### ***Strengths and limitations***

Use of LCA reduced complexity of the variable combinations into four distinct groups and allowed us to identify differences between the classes of long-term sick-listed individuals across diagnoses. Further, using prognostic factors on their continuous scale in the LCA retained all information on the variables, which is useful as sick individuals usually differ on a continuum rather than by dichotomous symptom or diseases states [9]. The classes in the present study were based on a priori identified prognostic factors that are predictors for RTW, thereby increasing theoretical validity.

There are some limitations to drawing strong conclusions from this study. First, the findings in the present study needs to be replicated and the classes validated in representative samples. Additional research should also be performed with additional or different prognostic variables to examine if the class structures and prevalences are significantly altered. Second, sick leave outcomes for these classes should be investigated to examine whether the classes predict prolonged sickness absence. Finally, the study may suffer from selection bias of participants that may affect the composition and prevalence of the classes.

### **Conclusions**

The present study show that a heterogeneous sample of long-term sick-listed individuals can be classified into four distinct classes based on prognostic RTW factors, largely independent of medical diagnosis. These four classes differed both in severity and qualitatively across prognostic factors for RTW. Identifying subgroups based on prognostic variables might be useful to identify problem areas that could be the focus for additional RTW follow-up.

Further research is needed to validate the class structure, the predictive validity of the classes and how they respond to interventions.

### **Informed consent**

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, and later revisions. Informed consent was obtained from all patients for being included in the study.

### **Conflicts of interest**

Authors Martin Inge Standal, Lene Aasdahl, Chris Jensen, Vegard Stolsmo Foldal, Roger Hagen, Egil A. Fors, Marit Solbjør, Odin Hjemdal, Margreth Grotle, and Ingebrigt Meisingset declare that they have no conflict of interest.

### **References**

1. Waddell G, Burton AK. Is work good for your health and wellbeing? London, UK: The Stationery Office; 2006.
2. Waddell G, Burton AK, Kendall NA. Vocational rehabilitation – what works, for whom, and when? London, UK: The Stationery Office; 2006.
3. Hoefsmit N, Houkes I, Nijhuis FJ. Intervention characteristics that facilitate return to work after sickness absence: a systematic literature review. *J Occup Rehabil.* 2012;22(4):462-77.
4. Cullen K, Irvin E, Collie A, Clay F, Gensby U, Jennings P, et al. Effectiveness of workplace interventions in return-to-work for musculoskeletal, pain-related and mental health conditions: an update of the evidence and messages for practitioners. *J Occup Rehabil.* 2018;28(1):1-15.
5. Vogel N, Schandelmaier S, Zumbrunn T, Ebrahim S, de Boer WE, Busse JW, et al. Return-to-work coordination programmes for improving return to work in workers on sick leave. *Cochrane Database Syst Rev.* 2017;3:CD011618.

6. Aasdahl L, Pape K, Vasseljen O, Johnsen R, Gismervik S, Halsteinli V, et al. Effect of Inpatient Multicomponent Occupational Rehabilitation Versus Less Comprehensive Outpatient Rehabilitation on Sickness Absence in Persons with Musculoskeletal- or Mental Health Disorders: A Randomized Clinical Trial. *J Occup Rehabil.* 2018;28(1):170-9.
7. Foster NE, Hill JC, Hay EM. Subgrouping patients with low back pain in primary care: are we getting any better at it? *Man Ther.* 2011;16(1):3-8.
8. Croft P, Altman DG, Deeks JJ, Dunn KM, Hay AD, Hemingway H, et al. The science of clinical practice: disease diagnosis or patient prognosis? Evidence about “what is likely to happen” should shape clinical practice. *BMC Med.* 2015;13(1):20.
9. Vickers AJ, Basch E, Kattan MW. Against diagnosis. *Ann Intern Med* 2008;149(3):200.
10. Norwegian Labour and Welfare Administration (NAV). Registered medically certified sick leave by diagnosis and place of residence, quarterly. Norwegian Labour and Welfare Administration. 2020. <https://www.nav.no/no/nav-og-samfunn/statistikk/sykefravar-statistikk/sykefravar>. Accessed 30 Apr 2020.
11. Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet.* 2016;388(10053):1545-602.
12. Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet.* 2012;380(9836):37-43.
13. Gragnano A, Negrini A, Miglioretti M, Corbière M. Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach. *J Occup Rehabil.* 2018;28(2):215-31.
14. Lloyd C, Waghorn G, McHugh C. Musculoskeletal disorders and comorbid depression: implications for practice. *Aust Occup Ther J.* 2008;55(1):23-9.

15. Black O, Keegel T, Sim MR, Collie A, Smith P. The Effect of Self-Efficacy on Return-to-Work Outcomes for Workers with Psychological or Upper-Body Musculoskeletal Injuries: A Review of the Literature. *J Occup Rehabil.* 2018;28(1):16-27.
16. Steenstra IA, Munhall C, Irvin E, Oranye N, Passmore S, Van Eerd D, et al. Systematic Review of Prognostic Factors for Return to Work in Workers with Sub Acute and Chronic Low Back Pain. *J Occup Rehabil.* 2017;27(3):369-81.
17. Koopmans PC, Bültmann U, Roelen CAM, Hoedeman R, van der Klink JLL, Groothoff W. Recurrence of sickness absence due to common mental disorders. *Int Arch Occup Environ Health* 2011;84(2), 193–201.
18. Lötters F, Hogg-Johnson S, Burdorf A. Health status, its perceptions, and effect on return to work and recurrent sick leave. *Spine.* 2005;30(9):1086-92.
19. Bouter LM, Pennick V, Bombardier C, Editorial Board of the Back Review Group. Cochrane back review group. *Spine.* 2003;28(12):1215-8.
20. Westman AE, Boersma K, Leppert J, Linton SJ. Fear-avoidance beliefs, catastrophizing, and distress: a longitudinal subgroup analysis on patients with musculoskeletal pain. *Clin J Pain.* 2011;27(7):567-77.
21. Hirsch O, Strauch K, Held H, Redaelli M, Chenot J-F, Leonhardt C, et al. Low back pain patient subgroups in primary care: pain characteristics, psychosocial determinants, and health care utilization. *Clin J Pain.* 2014;30(12):1023-32.
22. Meisingset I, Vasseljen O, Vøllestad NK, et al. Novel approach towards musculoskeletal phenotypes. *Eur J Pain.* 2020;24(5):921-932.
23. Gross DP, Armijo-Olivo S, Shaw WS, Williams-Whitt K, Shaw NT, Hartvigsen J, Qin Z, Ha C, Woodhouse LJ, Steenstra IA. Clinical decision support tools for selecting interventions for patients with disabling musculoskeletal disorders: a scoping review. *J Occup Rehab.* 2016;26(3):286-318.
24. Hill JC, Whitehurst DG, Lewis M, Bryan S, Dunn KM, Foster NE, et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet.* 2011;378(9802):1560-71.



25. Louwse I, van Rijssen HJ, Huysmans MA, van der Beek AJ, Anema JR. Predicting Long-Term Sickness Absence and Identifying Subgroups Among Individuals Without an Employment Contract. *J Occup Rehabil*. 2020; doi: 10.1007/s10926-020-09874-2
26. Foster NE, Hill JC, O'Sullivan P, Hancock M. Stratified models of care. *Best Pract Res Clin Rh*. 2013;27(5):649-61.
27. Aasdahl L, Foldal VS, Standal MI, Hagen R, Johnsen R, Solbjør M, et al. Motivational interviewing in long-term sickness absence: study protocol of a randomized controlled trial followed by qualitative and economic studies. *BMC Public Health*. 2018;18(1):756.
28. Folketrygdloven. National Insurance Act. Chapter 8. Sickness benefits. 1997. <https://lovdata.no/nav/folketrygdloven/kap8/>. Accessed 30 Apr 2020.
29. de Wit M, Wind H, Hulshof CTJ, Frings-Dresen MHW. Person-related factors associated with work participation in employees with health problems: a systematic review. *Int Arch Occup Environ Health*. 2018;91(5):497-512.
30. Vargas-Prada S, Demou E, Lalloo D, Avila-Palencia I, Sanati KA, Sampere M, et al. Effectiveness of very early workplace interventions to reduce sickness absence: a systematic review of the literature and meta-analysis. *Scand J Work Environ Health*. 2016;42(4):261-72.
31. van Vilsteren M, van Oostrom SH, de Vet HCW, Franche R-L, Boot CRL, Anema JR. Workplace interventions to prevent work disability in workers on sick leave. *Cochrane Database Syst Rev*. 2015(10):CD006955-CD.
32. Cancelliere C, Donovan J, Stockkendahl MJ, Biscardi M, Ammendolia C, Myburgh C, et al. Factors affecting return to work after injury or illness: best evidence synthesis of systematic reviews. *Chiropr Man Therap*. 2016;24(1):32.
33. Spitzer RL, Kroenke K, Williams JB, Lowe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092-7.
34. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606-13.
35. Kroenke K, Wu J, Yu Z, Bair MJ, Kean J, Stump T, et al. Patient Health Questionnaire Anxiety and Depression Scale: Initial Validation in Three Clinical Trials. *Psychosom Med*. 2016;78(6):716-27.

36. Cleeland CS, Ryan KM. Pain assessment: Global use of the Brief Pain Inventory. *Ann Acad Med Singap.* 1994;23(2):129-38.
37. Klepstad P, Loge JH, Borchgrevink PC, Mendoza TR, Cleeland CS, Kaasa S. The Norwegian brief pain inventory questionnaire: translation and validation in cancer pain patients. *J Pain Symptom Manage.* 2002;24(5):517-25.
38. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Qual Life Res.* 2011;20(10):1727-36.
39. Tuomi K, Ilmarinen J, Eskelinen L, Jarvinen E, Toikkanen J, Klockars M. Prevalence and incidence rates of diseases and work ability in different work categories of municipal occupations. *Scand J Work Env Hea.* 1991(1):67-74.
40. Kinnunen U, Nätti J. Work ability score and future work ability as predictors of register-based disability pension and long-term sickness absence: A three-year follow-up study. *Scand J Public Health.* 2018;46(3):321-30.
41. Ahlstrom L, Grimby-Ekman A, Hagberg M, Dellve L. The work ability index and single-item question: associations with sick leave, symptoms, and health – a prospective study of women on long-term sick leave. *Scand J Work Env Hea.* 2010;36(5):404-12.
42. Lagerveld SE, Blonk RWB, Brenninkmeijer V, Schaufeli WB. Return to work among employees with mental health problems: Development and validation of a self-efficacy questionnaire. *Work Stress.* 2010;24(4):359-75.
43. Folketrygdsloven. National Insurance Act. <https://lovdata.no/dokument/NL/lov/1997-02-28-19>. 1997. Accessed 30 Apr 2020.
44. World Organization of Family Doctors. ICPC-2. International Classification of Primary Care. Oxford, UK: Oxford University Press; 1998.
45. Kongsted A, Nielsen AM. Latent class analysis in health research. *J Physiother.* 2017;63(1):55-8.
46. Magidson J, Vermunt J. Latent class models for clustering: A comparison with K-means. *Canadian Journal of Marketing Research.* 2002;20(1):36-43.

47. Stahl D, Sallis H. Model-based cluster analysis. *Wiley Interdisciplinary Reviews: Computational Statistics*. 2012;4(4):341-58.
48. Sclove SL. Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika*. 1987;52(3):333-43.
49. Swanson SA, Lindenberg K, Bauer S, Crosby RD. A Monte Carlo investigation of factors influencing latent class analysis: An application to eating disorder research. *Int J Eat Disord*. 2012;45(5):677-84.
50. Nagin D. Group-based modeling of development. Cambridge, MA: Harvard University Press; 2005.
51. Masyn KE. Latent class analysis and finite mixture modeling. In: Little TD, editor. *The Oxford handbook of quantitative methods: Statistical analysis, Vol 2. Oxford library of psychology*. New York, NY, US: Oxford University Press; 2013. p. 551-611.
52. Asparouhov T, Muthén B. Residual Associations in Latent Class and Latent Transition Analysis. *Struct Equ Model*. 2015;22(2):169-77.
53. Serlin RC, Mendoza TR, Nakamura Y, Edwards KR, Cleeland CS. When is cancer pain mild, moderate or severe? Grading pain severity by its interference with function. *Pain*. 1995;61(2):277-84.
54. Fritz JM. Clinical prediction rules in physical therapy: coming of age? *J Orthop Sports Phys Ther*. 2009;39(3):159-61.
55. de Luca K, Parkinson L, Downie A, Blyth F, Byles J. Three subgroups of pain profiles identified in 227 women with arthritis: a latent class analysis. *Clin Rheumatol*. 2017;36(3):625-34.
56. Lee YC, Frits ML, Iannaccone CK, Weinblatt ME, Shadick NA, Williams DA, et al. Subgrouping of Patients With Rheumatoid Arthritis Based on Pain, Fatigue, Inflammation, and Psychosocial Factors. *Arthritis Rheumatol*. 2014;66(8):2006-14.
57. Virtanen M, Vahtera J, Head J, Dray-Spira R, Okuloff A, Tabak AG, et al. Work Disability among Employees with Diabetes: Latent Class Analysis of Risk Factors in Three Prospective Cohort Studies. *PLoS One*. 2015;10(11):e0143184-e.

58. Nielsen AM, Kent P, Hestbaek L, Vach W, Kongsted A. Identifying subgroups of patients using latent class analysis: should we use a single-stage or a two-stage approach? A methodological study using a cohort of patients with low back pain. *BMC Musculoskelet Disord.* 2017;18(1):57-.
59. Larsen FB, Pedersen MH, Friis K, Glümer C, Lasgaard M. A latent class analysis of multimorbidity and the relationship to socio-demographic factors and health-related quality of life. A national population-based study of 162,283 Danish adults. *PloS One.* 2017;12(1):e0169426.
60. Boersma K, Linton SJ. Screening to identify patients at risk: profiles of psychological risk factors for early intervention. *Clin J Pain.* 2005;21(1):38-72.
61. Reme SE, Shaw WS, Steenstra IA, Woiszwilllo MJ, Pransky G, Linton SJ. Distressed, immobilized, or lacking employer support? A sub-classification of acute work-related low back pain. *J Occup Rehabil.* 2012;22(4):541-52.
62. Shaw WS, Pransky G, Patterson W, Linton SJ, Winters T. Patient clusters in acute, work-related back pain based on patterns of disability risk factors. *J Occup Environ Med.* 2007;49(2):185-93.
63. Halonen JI, Solovieva S, Virta LJ, Laaksonen M, Martimo KP, Hiljanen I, et al. Sustained return to work and work participation after a new legislation obligating employers to notify prolonged sickness absence. *Scand J Public Health.* 2018;46(19\_suppl):65-73.
64. Sowden G, Hill JC, Morso L, Louw Q, Foster NE. Advancing practice for back pain through stratified care (STarT Back). *Braz J Phys Ther.* 2018;22(4):255-64.
65. Vermeulen SJ, Anema JR, Schellart AJ, Knol DL, van Mechelen W, van der Beek AJ. A participatory return-to-work intervention for temporary agency workers and unemployed workers sick-listed due to musculoskeletal disorders: results of a randomized controlled trial. *J Occup Rehabil.* 2011;21(3):313-24.
66. Nieuwenhuijsen K, Faber B, Verbeek JH, et al. Interventions to improve return to work in depressed people. *Cochrane Database Syst Rev.* 2014;(12):CD006237. doi:10.1002/14651858.CD006237.pub3

67. Lagerveld SE, Blonk RW, Brenninkmeijer V, Wijngaards-de Meij L, Schaufeli WB. Work-focused treatment of common mental disorders and return to work: a comparative outcome study. *J Occup Health Psychol.* 2012;17(2):220.
68. van der Windt D, Hay E, Jellema P, Main C. Psychosocial interventions for low back pain in primary care: lessons learned from recent trials. *Spine.* 2008;33(1):81-9.
69. Bültmann U, Franche RL, Hogg-Johnson S, Côté P, Lee H, Severin C, Vidmar M, Carnide N. Health status, work limitations, and return-to-work trajectories in injured workers with musculoskeletal disorders. *Qual Life Res.* 2007;16(7):1167-78.
70. Jørgensen CK, Fink P, Olesen F. Psychological Distress Among Patients With Musculoskeletal Illness in General Practice. *Psychosomatics.* 2000;41(4):321-9.
71. Steenstra IA, Ibrahim SA, Franche RL, Hogg-Johnson S, Shaw WS, Pransky GS. Validation of a risk factor-based intervention strategy model using data from the readiness for return to work cohort study. *Journal of occupational rehabilitation.* 2010;20(3):394-405.
72. Marin TJ, Van Eerd D, Irvin E, Couban R, Koes BW, Malmivaara A, et al. Multidisciplinary biopsychosocial rehabilitation for subacute low back pain. *Cochrane Database Syst Rev.* 2017;6:CD002193.
73. Shaw WS, Linton SJ, Pransky G. Reducing sickness absence from work due to low back pain: how well do intervention strategies match modifiable risk factors? *J Occup Rehabil.* 2006;16(4):591-605.
74. Flavel J. An Analysis of the Impact of Health on Occupation. *Econ Rec.* 2017;93:86-104.
75. Shaw WS, Reme SE, Pransky G, Woiszwilllo MJ, Steenstra IA, Linton SJ. The pain recovery inventory of concerns and expectations: a psychosocial screening instrument to identify intervention needs among patients at elevated risk of back disability. *J Occup Environ Med.* 2013;55(8):885-94.
76. Hancock M, Herbert RD, Maher CG. A Guide to Interpretation of Studies Investigating Subgroups of Responders to Physical Therapy Interventions. *Phys Ther.* 2009;89(7):698-704.



# Paper III





## **Workplace resources important for part-time sick leave selection – an exploratory cross-sectional study of long-term sick listed in Norway**

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## **Abstract**

**Background:** Part-time sick leave (PTSL) is often used to utilize remaining work ability of sick-listed workers and promote return to work. The effects of PTSL are uncertain due to participant selection on factors not easily captured by observational registry-based evaluations. More knowledge on health-related, workplace and personal characteristics that influence the propensity to utilize PTSL is needed.

The objectives of the present study was to explore whether individuals on PTSL and full-time sick leave (FTSL) differ in health, workplace resources and individual resilience while also considering known factors that influence PTSL selection.

**Methods:** Cross-sectional sample of 661 workers sick listed for eight weeks and 50-100% sick-listing degree. Current health, previous sick leave, work adjustment, psychosocial environment, autonomy, demands, and resilience between PTSL and FTSL were examined and adjusted for known selection factors using logistic regression.

**Results:** An inverse U-shaped curvilinear association between self-reported health and PTSL was identified. Additionally, those on PTSL had greater workplace adjustment latitude, better psychosocial work environment and more work autonomy. These differences persisted after adjusting for known sociodemographic selection factors. The PTSL group reported poorer coping with work demands while previous long-term sick leave and resilience revealed no difference.

**Conclusions:** The present study found selection of PTSL in self-reported health and workplace resources, such as adjustment latitude, that were independent of known sociodemographic selection factors. To improve the accuracy of future effect evaluations of PTSL attention should be given to workplace factors and health status that may not be captured in observational studies using register-data.

**Key terms:** workplace adjustment latitude, psychosocial work environment, work autonomy, psychological resilience, graded leave, work activation

## **Background**

Long-term sick leave is costly for society and have detrimental impacts on the individual [1]. In order to reduce sickness absence rates several countries have implemented reforms promoting work-related activity for the long-term sick listed [2]. Part-time sick leave (PTSL), where individuals works a percentage corresponding to their remaining work ability, is often used [3] as remaining at work even with sickness or disabilities is thought to be beneficial to the worker [1].

Several studies find favorable outcomes for PTSL on return to work (RTW) [4-8], but others question the overall effectiveness [9-11]. Reaching firm conclusions are difficult due to the selection effect related to the use of PTSL [12]. That is, workers who are able to utilize PTSL have different personal or workplace characteristics than workers on full-time sick leave (FTSL), and therefore different probabilities of successful RTW. For example, studies have shown that age, gender, education, diagnosis, manual or office labour, and private or public sector, differ between those on PTSL and FTSL [13-17]. These selection effects make direct comparisons between the groups difficult and create uncertainty around efforts to control for such confounding, for example by using propensity score matching [18]. Using a randomized controlled trial design would eliminate bias caused by selection effects but is rarely feasible when examining PTSL as these arrangements usually are national schemes and thus eligible for everyone [19]. In addition, randomizing individuals to more or less sick leave than they are capable of handling is ethically problematic. As a result most evaluations use register-based samples. One exceptions is the study by Viikari-Juntura et al. [6], where individuals with musculoskeletal disorders were randomized to PTSL or FTSL with improved RTW outcomes for the PTSL group. In another study, Rehwald et al. [8] included PTSL as one potential component of an intervention for newly sick listed individuals. However, even though participation to the intervention group was randomized, the use of PTSL was decided by the administering job center, adapted for individual needs and local conditions. Thus, selection could still play a role, for instance through work characteristics.

In previous register-based studies, most of the variability in PTSL selection seems to be explained by unobserved factors [20]. Some of these unobserved factors have been proposed to include the health of the worker, and individual and work-related characteristics which may influence the propensity to use PTSL [12, 15]. Differences between those on PTSL and FTSL with regards to these characteristics, for example psychosocial work

environment, workplace adjustment latitude, or individual resilience, are difficult to capture using registry data. Some factors have been examined by self-report or using proxies, but the data is scarce and inconsistent. For instance, better health among those on PTSL have been proposed [5], while other studies report poorer health, more previous sick leave, or chronicity [3, 18, 21], and some studies also find no differences [13, 16]. Better psychosocial work environments and less conflict at work have also been found for those on PTSL [11, 21]. However, knowledge regarding workplace adjustment latitude, work autonomy, and work-related personal factors such as the capacity to cope with demands and personal factors such as individual resilience are still lacking. Resilience can be defined as the social and personal resources that may be activated in the context of stress [22] and may thus influence the decision to remain at work despite ill health or other difficulties.

PTSL is a frequently used tool to reduce sickness absence rates in several countries [3]. It is therefore important to know more about such arrangements [23]. Hence, the objectives of the present study were to:

(1) explore whether long-term sick listed individuals on PTSL and full-time sick leave (FTSL) differ on previously identified selection factors (age, gender, education, private or public sector, diagnosis, and physical demands of work).

(2) explore differences between these PTSL and FTSL group in health, workplace and personal characteristics that could influence the propensity for PTSL (current self-reported health, previous long-term sick leave, workplace adjustment latitude, psychosocial work environment, work autonomy, coping with work demands, and psychological resilience).

(3) examine whether identified differences in (2) persisted independent of the known selection factors in (1).

## **Methods**

### ***Study design***

This was a cross-sectional study using data from a cohort of sick listed workers in an ongoing randomized controlled trial [24]. Data in the study was collected at baseline, prior to randomization. The study was approved by the Regional Committee for Medical and Health

Research Ethics in South East Norway (No: 2016/2300). Written informed consent was obtained from all participants.

### ***Study setting***

In Norway, employees are entitled to 12 months of full wage benefits when on sick leave. The general practitioner (GP) is usually the first point of contact for individuals seeking sick leave and PTSL is to be regarded as the rule rather than the exception for GPs writing sick leave certification [25]. The first sixteen days of sick leave benefits are covered by the employer while the remaining is paid by the National Insurance Scheme through the Norwegian Labour and Welfare Administration (NAV) [26]. The employer has the main responsibility of assisting the sick-listed worker back to work. By four weeks of sick leave, the employer and sick-listed worker are to create a plan outlining measures which can help the sick-listed return to work. Within eight weeks work-related activities are mandatory. If such activities are not resumed an expanded sick leave certificate documenting medical reasons is required [26, 27]. NAV has a coordinating role in sick leave follow-up, and can also suggest interventions and work activities to promote RTW, such as PTSL [28].

### ***Participants and recruitment***

Participants in the present study were employed workers aged 18-62 at eight weeks of current sick leave with a leave status of 50-100%. Eligible participants living in Trondheim, Central Norway, were invited via NAV's electronic communication site. All participants included in the trial from start in August 2017 until March 2020 was included in the present study. In this period 5748 individuals were invited, of which 852 (15%) accepted and received a web-based questionnaire by e-mail. This questionnaire was answered by 669 (78%) of the included participants. One participant withdrew their data from the study leaving 668 for the present study.

### ***Measurement instruments***

The questionnaire included covariates that were selected for use in the present study based on previously identified differences between those on PTSL and FTSL. These variables were,

age, gender, education, the physical demands of one's work, work sector, and diagnosis. Additional proposed selection factors were included based on their uncertain evidence of PTSL selection (self-reported health, previous sick leave, and psychosocial work environment), or based on evidence of being prognostic RTW factors (work adjustment latitude, autonomy at work, and coping with work demands [29-31]). In addition, psychological resilience was also examined due to its potential influence on the propensity to utilize PTSL.

#### *Part-time sick leave*

Information on sick leave degree in percentage was obtained from the sick leave certificate by NAV. This variable was dichotomized as being part-time sick listed (less than 100% sick leave percentage) or full-time sick listed.

#### *Covariates – previously identified selection factors*

Age was used as a continuous variable. Education was dichotomized into higher (minimum three years of college/university) or lower education. Work sector was dichotomized as public or private, and a response option “Do not know/unsure” was set to missing ( $n = 9$ ). Participants were asked to describe their work with the categories “Mostly sedentary work”, “Work that demand that you walk a lot”, “Work where you walk and lift a lot”, “Heavy manual labour”, and “Do not know/unsure”. These categories were dichotomized into physically demanding work or not by combining the two less demanding categories and the two more demanding categories. “Do not know / unsure” was set to missing ( $n = 20$ ). Diagnosis was obtained from NAV from the sick listing certificate set by the individual's GP using the International Classification of Primary Care (ICPC-2) [32]. Diagnosis was categorized as “Musculoskeletal” (ICPC-2 L), “Psychological” (ICPC-2 P), or “Other” (containing all other diagnoses).

#### *Proposed selection factors*

Self-reported health was assessed using the visual analogue scale from the EQ-5D-5L questionnaire [33] where participants are to rate their current health on a scale from 0-100 (0

worst possible health - 100 best possible health). Previous long-term sick leave was assessed by asking participants whether they have had a previous sick leave episode lasting more than eight weeks.

Workplace adjustment latitude was examined with the question “To what degree do you feel your workplace facilitates work adjustments?”. Response options ranged from 1 (to a very low degree) to 10 (to a very high degree). Psychosocial work environment was examined by asking “How would you rate the psychosocial work environment at work? (1 is very bad – 10 is very good)”. A question querying “To what degree are you able to plan your own work (1 is to a very small degree and 10 is to a very large degree)” was used to assess work autonomy. Coping with work demands was assessed by using the question “How well do you feel you cope with the demands of your work? (1 is very badly and 10 is very well)”.

Resilience was assessed using the Resilience Scale for Adults [34, 35]. The scale consists of 33 questions assessing the individual’s social competence, social resources, planned future, family cohesion, structured style and perception of self on a range from 1 (low) to seven (high). Average score of the 33 items was used.

### ***Statistical analysis***

Descriptive statistics described workers on PTSL and FTSL. Means and standard deviations were used for continuous variables, and counts and proportions for categorical variables. Bivariate logistic regression models were fitted to each independent variable and the dependent variable to examine significant differences between those on PTSL and FTSL. All variables with significant associations with PTSL in the bivariate analysis were then adjusted for covariates to examine whether the associations persisted after adjusting for known differences. For all logistic regression analyses, odds ratios (OR) and 95% confidence intervals were reported. Quadratic associations were also investigated for age and self-reported health as these associations with PTSL have been proposed to be curvilinear [4, 17]. F-tests were used to assess whether including the quadratic terms significantly improved the models. Observations were dropped if data were missing for sick leave degree ( $n = 7$ ). A significance level of  $\pm = 0.05$  was used throughout. To infer results in the regressions from missing values, 10 datasets were created using multiple imputation by chained equations. No particular patterns of missing data were identified. The most repeated pattern of missing data consisted of three 3 percent of observations with one missing value, while 76% of

observations had complete data. Counts can be found in Table 1. All variables were used in the imputation and no auxiliary variables were used. All analyses were performed using Stata 16.1 (StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC).

## Results

### *Sample description*

A total of 661 participants were included in the analysis. Descriptive statistics can be found in Table 1 and show that 394 participants (40%) were on PTSL. The most common part-time certificate was 50%, which was the case for nearly half of those on PTSL. The PTSL group included more women, more with higher education, and fewer with physically demanding work and working in the private sector than the FTSL group. There were less prominent differences for diagnosis.

There were negligible differences in self-reported health and previous long-term sick leave. Inspection of work-related factors revealed that workplace adjustment latitude, psychosocial work environment and work autonomy was reported as higher for those on PTSL compared to the FTSL group. Those on PTSL described poorer coping with work demands while the groups reported being equally resilient.

Table 1 – Characteristics of the overall sample, part-time sick listed (PTSL) and full-time sick listed (FTSL)

Variable	Sample <i>n</i> = 661	PTSL <i>n</i> = 267 (40%)	FTSL <i>n</i> = 394 (60%)
Age ( <i>n</i> =648)	44.3 (10.0)	44.0 (9.4)	44.4 (10.4)
Gender ( <i>n</i> =660) – <i>n</i> female (%)	422 (64%)	189 (71%)	233 (59%)
Education ( <i>n</i> =659) – <i>n</i> higher (%)	422 (64%)	192 (72%)	230 (59%)
Physically demanding work ( <i>n</i> =635) – <i>n</i> yes (%)	220 (35%)	69 (26%)	151 (40%)
Sector ( <i>n</i> =646) – <i>n</i> private (%)	325 (50%)	121 (46%)	204 (53%)
Diagnosis ( <i>n</i> =637)			
- Musculoskeletal – <i>n</i> (%)	240 (38%)	92 (35%)	148 (40%)
- Psychological – <i>n</i> (%)	194 (30%)	93 (35%)	101 (27%)
- Other – <i>n</i> (%)	203 (32%)	78 (30%)	125 (33%)
Self-reported health (1-100) ( <i>n</i> =597)	50.4 (21.2)	52.0 (19.4)	49.3 (22.4)



Previous long-term sickness absence (n=634) – n yes (%)	417 (66%)	172 (67%)	245 (65%)
Workplace adjustment latitude (1-10) (n=647)	6.0 (3.0)	6.5 (2.9)	5.6 (3.0)
Psychosocial work environment (1-10) (n=645)	7.1 (2.6)	7.4 (2.5)	6.9 (2.7)
Work autonomy (1-10) (n=642)	6.0 (2.9)	6.4 (2.8)	5.8 (3.0)
Coping with work demands (1-10) (n=647)	8.0 (2.1)	7.7 (2.2)	8.1 (2.0)
Resilience (1-7) (n=630)	5.1 (0.9)	5.0 (0.9)	5.1 (1.0)

**Notes:** Values given are counts (%) for categorical variables and mean (SD) for continuous variables. **Education:** Percentage of individuals that have completed a minimum of three years of higher education at the college or university level. **Physically demanding work:** Percentage of individuals that rate their work as “demanding a lot of walking and lifting” or “heavy manual labour”. **Diagnosis:** Percentage of individuals classified with musculoskeletal, psychological or ‘other’ diagnosis using the International Classification of Primary Care 2<sup>nd</sup> edition (ICPC-2). **Previous long-term sickness absence:** Percentage of individuals who reported a previous sick leave episode lasting more than eight weeks.

#### *Logistic regressions - associations with part-time sick leave*

The results of the bivariate analyses (Table 2) revealed several statistically significant differences between those on PTSL and FTSL. Individuals utilizing PTSL were more often female (OR 1.69 CI 1.21-2.36) had higher education (OR 1.80 CI 1.29-2.51), had less physically demanding work (OR 0.54 CI 0.38-0.76), and more frequently a psychological diagnosis (OR 1.47 CI 1.05-2.06). On average, individuals in the PTSL group scored higher on workplace adjustment latitude (OR 1.10 CI 1.04-1.16), psychosocial work environment (OR 1.07 CI 1.01-1.14), and work autonomy (OR 1.07 CI 1.02-1.13) but scored lower on coping with work demands (OR 0.92 CI 0.85-0.99). No linear associations were found for age, sector, self-reported health, previous sick leave, or resilience.

The covariate adjusted analyses can be found in Table 2. The statistically significant differences for gender (OR 1.60 CI 1.12-2.30) and physically demanding work (OR 0.61 CI 0.42-0.89) persisted after adjustment for the other covariates, while education and diagnostic categories now revealed no significant association. Further, the covariate adjusted analyses show that workplace adjustment latitude (OR 1.10, CI 1.04-1.16), psychosocial work environment (OR 1.10 CI 1.03-1.18), and work autonomy (OR 1.06, CI 1.00-1.13) were

significantly associated with being on PTSL also after adjusting for known differences. Coping with work demands was no longer significant at the 95% level (CI 0.87-1.02).

Table 2 – Logistic regression of part-time sick leave compared to full-time sick leave.

Variable	Bivariate OR (95% CI)	Covariate adjusted OR (95% CI)
Age	1.00 (0.98-1.01)	0.99 (0.98-1.01)
Gender (female)	<b>1.69 (1.21-2.36)</b>	<b>1.57 (1.10-2.25)</b>
Education (higher)	<b>1.80 (1.29-2.51)</b>	1.39 (0.95-2.03)
Physically demanding work (yes)	<b>0.54 (0.38-0.76)</b>	<b>0.60 (0.41-0.89)</b>
Sector (private)	0.73 (0.53-1.00)	0.93 (0.66-1.33)
Diagnosis (ICPC-2)		
- Musculoskeletal (ICPC-2 L)	0.80 (0.58-1.12)	1.02 (0.72-1.45)
- Psychological (ICPC-2 P)	<b>1.47 (1.05-2.06)</b>	1.31 (0.92-1.87)
Self-reported health	1.01 (0.99-1.01)	N/A
Previous long-term sickness absence (yes)	1.11 (0.80-1.57)	N/A
Workplace adjustment latitude	<b>1.10 (1.04-1.16)</b>	<b>1.09 (1.03-1.16)</b>
Psychosocial work environment	<b>1.07 (1.01-1.14)</b>	<b>1.10 (1.03-1.18)</b>
Work autonomy	<b>1.07 (1.02-1.13)</b>	<b>1.06 (1.00-1.13)</b>
Coping with work demands	<b>0.92 (0.85-0.99)</b>	0.95 (0.88-1.02)
Resilience	0.90 (0.76-1.07)	N/A

**Notes:** Odds ratios (OR) and 95% confidence intervals (CI) are reported. **Education (higher):** Having completed a minimum of three years of education at the college or university level. **Physically demanding work (yes):** Rating work as “demanding a lot of walking and lifting” or “heavy manual labour”. **Diagnosis:** Diagnosis using the International Classification of Primary Care 2<sup>nd</sup> edition (ICPC-2). **Previous long-term sickness absence (yes):** Having had a previous sick leave episode lasting more than eight weeks. **Covariate adjusted model:** Proposed selection factors (workplace adjustment latitude, psychosocial work environment, work autonomy, coping with work demands) individually adjusted for covariates (age, gender, education, physically demanding work, sector, and diagnosis). N/A indicate that the variable was not significant in the bivariate analysis, and thus not adjusted for covariates.

#### Curvilinear associations

Curvilinear associations were found for both age and self-reported health. When adding a quadratic age term to the equations F-tests revealed that a quadratic age term only statistically significantly improved the bivariate model ( $F_{1,12536} = 6.11, p < 0.014$ ) and not the covariate

adjusted model. Apex of the bivariate age-PTSL curve was at 42.0 years (see Figure 1). When adding a quadratic self-reported health term, F-tests revealed significant improvements for both models (bivariate model:  $F_{1,169} = 5.95, p < 0.016$ ; covariate adjusted model:  $F_{1,173} = 4.47, p < 0.036$ ). Apexes for self-reported health were at 56.3 and 57.0 for the two curves respectively (see Figure 2).

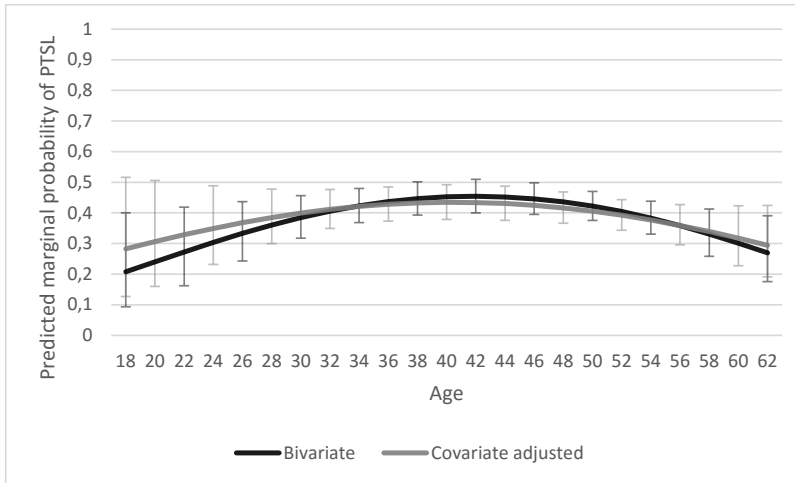


Figure 1 – Predicted marginal probabilities of age on part-time sick leave. Unadjusted and covariate adjusted models.

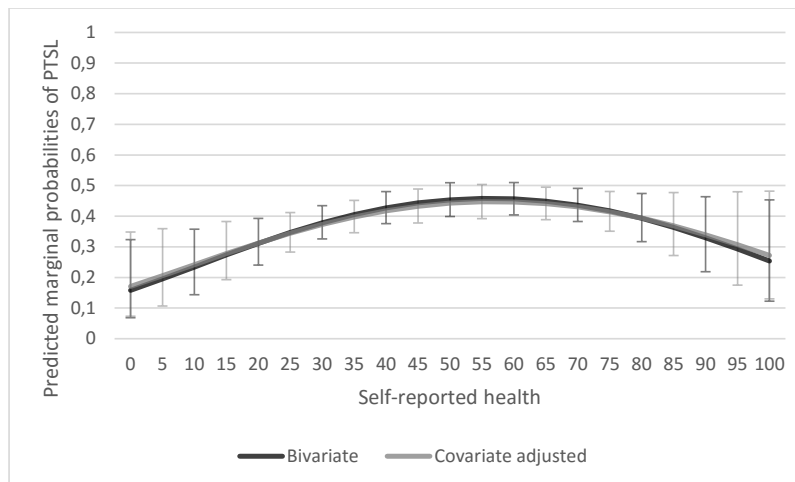


Figure 2 – Predicted marginal probabilities of self-reported health on part-time sick leave. Unadjusted and covariate adjusted models.

## Discussion

This cross-sectional study of workers sick listed for eight weeks aimed to describe differences between long-term sick listed workers on PTSL and FTSL on health, workplace and personal characteristics while taking known differences from earlier research into account.

There was a convincing selection effect of PTSL in the present study. In line with previous research the results show that individuals on PTSL more often were women, had higher education, less physically demanding work, and more often worked in the public sector [13, 15-17]. We also find less PTSL among the oldest and youngest, which is comparable to the findings of Ose et al. [17]. The age-PTSL curve peaked at 42 years, meaning those in the middle of their working life were the most likely to be part-time sick listed. Younger age has been associated with lower job satisfaction [36], and a poorer job-person fit that changes with age have also been hypothesized [37]. Additionally, increasing age has been associated with a more restrictive attitude towards sick listing in the Nordic countries [20, 38], but older age is also accompanied by poorer health. Such factors could partly explain the curvilinear association and when adjustments for the covariates were made, the curve flattened revealing smaller age differences.

The present study also found more individuals in the PTSL group sick listed due to a psychological diagnosis compared to the FTSL group. This difference has also been identified in Norwegian population data [15]. Even though more individuals with a psychological diagnosis was on PTSL than FTSL in the present and previous studies, the potential benefits of PTSL have been proposed to be less convincing for workers with mental health disorders [8, 11, 39]. However, work-focused cognitive behavioral therapy in combination with gradual work resumption has been shown to be beneficial for RTW in this patient group [40], indicating that treatment options also play a role.

We found no differences regarding previous long-term sick leave between the groups which supported results from Finland [13, 16], but were counter to studies finding associations with less PTSL [5] or more PTSL [18, 41]. Regarding current health we identified an inverse U-shaped curvilinear relationship between self-reported health status and PTSL. This association has been previously hypothesized due to the potential costs to the employer when facilitating PTSL which could mean that individuals with the best health may be close to RTW and skip PTSL altogether, while those with poorest health may be too ill to

work at all [4]. The association in the present study largely did not change after adjusting for known differences, indicating a robust curvilinear association.

The present study found that adjustment latitude, psychosocial work environment and work autonomy were associated with more PTSL while the associations with regards to coping with work demands and resilience were less convincing. In the present study there was a clear tendency towards more flexible workplaces among workers on PTSL which could be related to the higher proportion with higher education and sedentary work for those on PTSL. However, the selection effects of workplace factors persisted after adjusting for such covariates. Thus, adjusting for selection via registry data may not capture all important workplace characteristics. Previous research has found that psychosocial work environment and social support at work are important for RTW [42, 43] and may also influence the propensity to remain partly at work when sick listed. Similarly, adjusting work has shown to be important for RTW [31], and Vooijs et al. [44] argued that the most effective interventions improving work participation were those focusing on changes at work rather than changing the individual's abilities to meet work demands.

Individuals in the PTSL group in the present study reported poorer coping with work demands. However, the mechanisms behind this is difficult to gauge in a cross-sectional study as high demands is also risk factor for sick leave [45], and workers with manageable work demands may not be sick listed at all. However, the differences were slightly diminished when adjusting for the covariates, indicating that other characteristics also play a role (e.g. through education). Regardless, having focus on work demands when facilitating part-time sick leave could be beneficial. Workers returning from sick leave need to have flexibility in order to successfully maintain health while meeting expected productivity demands [46].

In order to know more about the potential benefits of PTSL, it is important to know what characterizes those who are on graded leave as these systems usually are nationwide policies [3, 19]. Identifying factors are associated with PTSL could inform stakeholders such as GPs, employers, RTW coordinators and the social insurance services to develop solutions for work activation. Unobserved confounding may also contribute to wrong conclusions of evaluations of PTSL which again influence recommendations and policy. Thus, knowing what contribute to PTSL selection is important in order to know whether to include such factors when evaluating PTSL. Based on the results of this study, future evaluations should

include more workplace characteristics, while controlling for individual personal and social resources (i.e. resilience) may not be as important.

### **Strengths and limitations**

One strength of the current study is the extent of covariates which enables us to accurately investigate the association of previously unexplored factors on the propensity to utilize PTSL. Registry data on the outcome variable can also be considered a strength as it helps avoid biases caused by self-report.

A limitation of the present study is the low recruitment rate of participants which could indicate participant selection. However, the present study largely found the same differences between PTSL and FTSL on sociodemographic covariates as previous register-based studies which indicate that the current sample might be comparable to representative population studies. Another limitation in the present study is the use of single-item variables to examine workplace characteristics. Single-item variables make determination of exactly how these characteristics were different between the groups impossible, and may also lack construct validity. Future studies should use a broader set of validated questionnaires to investigate different aspects of work that could facilitate PTSL. The present study also lack data on the sick listing GP's propensity to certify PTSL. Previous research has shown that GPs has some influence in determining sick listing percentage [47] and could thus influence PTSL selection.

### **Conclusions**

There was a significant selection for the use of PTSL in the present study. We identified differences between workers on PTSL and FTSL in sociodemographic factors that were in line with previous population-based studies. The study also contributes to the existing evidence base by presenting an inverse-U shaped curvilinear association between self-reported health and PTSL that needs to be further examined. Furthermore, the study indicated that those on PTSL and FTSL differ with respect to workplace resources independently of previously identified sociodemographic selection factors. In order to improve accuracy of future effect evaluations of PTSL, further attention should also be given to workplace and the health continuum that may not be captured by registries.

## **List of abbreviations**

FTSL – Full-time sick leave

GP – General practitioner

ICPC – International Classification of Primary Care

NAV – Norwegian Labour and Welfare Administration

PTSL – Part-time sick leave

RTW – Return to work

## **Declarations**

### ***Ethics approval and consent to participate***

The study was approved by the Regional Committee for Medical and Health Research Ethics in South East Norway (No: 2016/2300). Written informed consent was obtained from all participant in the study.

### ***Consent for publication***

Not applicable.

### ***Availability of data and materials***

The datasets generated and analysed during the current study are not publicly available due to protecting the anonymity of participants.

### ***Competing interests***

The authors declare that they have no competing interests.

### ***Funding***

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### ***Author's contribution***

All authors contributed to the study conception and design. Data collection were performed by MIS and VSF. Data analysis were performed by MIS and OH. The first draft of the manuscript was written by MIS and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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## References

1. Waddell G, Burton AK. Is work good for your health and wellbeing? London, UK: The Stationery Office; 2006.
2. Røed, K. Active social insurance. *IZA J Labor Policy*. 2012;1:8.
3. Kausto J, Miranda H, Martino K-P, Viikari-Juntura E. Partial sick leave—review of its use, effects and feasibility in the Nordic countries. *Scand J Work Env Hea*. 2008;34(4):239-249.
4. Markussen S, Mykletun A, Røed K. The case for presenteeism – Evidence from Norway’s sickness insurance program. *J Public Econ*. 2012;96(11-12):959-972.
5. Høgelund J, Holm A, McIntosh J. Does graded return-to-work improve sick-listed workers’ chance of returning to regular working hours? *J Health Econ*. 2012;29(1):158-169.
6. Viikari-Juntura E, Kausto J, Shiri R, Kaila-Kangas L, Takala E-P, Karpinnen J, et al. Return to work after early part-time sick leave due to musculoskeletal disorders: a randomized controlled trial. *Scand J Work Env Hea*. 2012;38(2):134-143.
7. Meneses-Echavez JF, Baiju N, Berg RC. Effects of partial sick leave versus full-time sick leave on sickness absence and work participation: a systematic mapping review. Oslo, Norway: Norwegian Institute of Public Health; 2018.
8. Rehwald K, Rosholm M, Rouland B. Labour market effects of activating sick-listed workers. *Labour Econ*. 2018;53:15-32.
9. Lie SA. Liten effekt av gradert sykmelding for raskere retur til arbeid. En kausal analyse av registerdata for varighet av sykefravær, ulike trygdeytelser og retur til jobb. [Small effects of graded sick leave for faster return to work. A causal analysis of registry-data for length of sick leave, various benefits and return to work]. Bergen, Norway: Uni Helse; 2014.
10. Bosman LC, Twisk JWR, Geraedts AS, Heymans MW. Effects of Partial Sick Leave on Sick Leave Duration in Employees with Musculoskeletal Disorders. *J Occup Rehabil*. 2020;30:203-2010.
11. Kools L, Koning P. Graded return-to-work as a stepping stone to full work resumption. *J Health Econ*. 2019;65:189-209.
12. Mykletun A, Eriksen HR, Røed K, Schmidt G, Fosse A, Damberg G, et al. Tiltak for reduksjon i sykefravær: Aktiviserings- og nærværsreform. [Policies for reduced sick leave: activity and presence reform]. Oslo: Norwegian Ministry of Labour; 2010.

13. Kausto J, Virta L, Luukkonen R, Viikari-Juntura E. Associations between partial sickness benefit and disability pensions: initial findings of a Finnish nationwide register study. *BMC Public Health*. 2010;10(1):361.
14. Kausto J, Viikari-Juntura E, Virta E, Gould R, Koskinen A, Solovieva S. Effectiveness of new legislation on partial sickness benefit on work participation: a quasi-experiment in Finland. *BMJ Open*. 2014;4(12).
15. Brage S, Kann IC, Kolstad A, Nossen JP, Thune O. Gradert sykmelding – omfang, utvikling og bruk. [Graded sick leave – extent, development and use]. *Arbeid og velferd*. 2011;3:32-44.
16. Viikari-Juntura E, Virta L, Kausto J, Autti-Rämö I, Martimo K-P, Laaksonen M, et al. Legislative change enabling use of early part-time sick leave enhanced return to work and work participation in Finland. *Scand J Work Env Hea*. 2017;43(5):447-456.
17. Ose SO, Kaspersen SL, Reve SH, Mandal R, Jensberg H, Lippestad J. Sykefravær–gradering og tilrettelegging. [Sick leave – grading and facilitation]. Trondheim, Norway: SINTEF; 2012.
18. Schneider U, Linder R, Verheyen F. Long-term sick leave and the impact of a graded return-to-work program: evidence from Germany. *Eur J Health Econ*. 2016;17(5):629-643.
19. Nossen JP, Brage S. Effekt av gradert sykmelding – betydningen av metodevalg. [The effects of graded sick leave – the significance of choice in method]. *Arbeid og velferd*. 2013;3.
20. Markussen S, Røed K, Røgeberg OJ, Gaure S. The anatomy of absenteeism. *J Health Econ*. 2011;30(2):277-292.
21. Eklund M, von Granotz H, Marklund S. Deltidssjukskrivning – individ, arbeidsplats och hälsa. [Part-time sick leave–individual, work place and health]. In: Högstedt C, Bjurvald M, Marklund S, Palmer E, Theorell T. Den höga sjukfrånvaron – sanning och konsekvens. [The high sick leave – truth and consequence]. Stockholm, Sweden: Public Health Agency of Sweden; 2004.
22. Morote R, Hjemdal O, Martinez Urbine P, Corveleyn J. Psychometric properties of the Resilience Scale for Adults (RSA) and its relationship with life-stress, anxiety and depression in a Hispanic Latin-American community sample. *PloS One*. 2017;12(11).
23. Nossen JP, Lysø N. Gradert sykmelding – økt gradering, stabil varighet. [Graded sick leave – increased degree, stable duration]. *Arbeid og velferd*;2018(2).

24. Aasdahl L, Foldal VS, Standal MI, Hagen R, Johnsen R, Solbjør M, et al. Motivational interviewing in long-term sickness absence: study protocol of a randomized controlled trial followed by qualitative and economic studies. *BMC Public Health*. 2017;18(1):756.
25. Norwegian Directorate of Health. Nasjonal sykmeldingsveileder. [National guideline for sickness certification]. 2020. Retrieved from <https://www.helsedirektoratet.no/veiledere/sykmelderveileder>. Accessed 24 Aug 2020.
26. Folketrygdløven. National Insurance Act. 1997. Retrieved from <https://lovdata.no/dokument/NL/lov/1997-02-28-19> Accessed 24 Aug 2020.
27. Norwegian Labour and Welfare Administration. Sickness benefits for employees. 2020. Retrieved from <https://www.nav.no/en/home/benefits-and-services/Sickness-benefit-for-employees>. Accessed 24 Aug 2020.
28. Brage S, Kristoffersen P, Lysø N. NAVs oppfølging av sykmeldte. [NAV's follow-up of the sick listed]. *Arbeid og velferd*; 2014(1):78-89.
29. Cancellere C, Donovan J, Stochkendahl MJ, Biscardi M, Ammendolia C, Myburgh C, Cassidy JD. Factors affecting return to work after injury or illness: best evidence synthesis of systematic review. *Chiropr Man Therap*. 2016;24(1):32.
30. Gragnano A, Negrini A, Miglioretti M, Corbière M. Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach. *J Occup Rehabil*. 2018;28(2):215-231.
31. van Vilsteren M, van Oostrom SH, de Vet HC, Franche RL, Boot CR, Anema JR. Workplace interventions to prevent work disability in workers on sick leave. *ochrane Database Syst Rev*. 2015(10).
32. World Organization of Family Doctors. ICPC-2. International Classification of Primary Care. Oxford, UK: Oxford University Press; 1998.
33. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Qual Life Res*. 2011;20(10):1727-36.
34. Friborg O, Hjemdal O, Rosenvinge JH, Martinussen M. A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment? *Int J Meth Psych Res*. 2003;12(2):65-76.

35. Hjemdal O, Friborg O, Martinussen M, Rosenvinge JH. Preliminary results from the development and validation of a Norwegian scale for measuring adult resilience. *Journal of the Norwegian Psychological Association*. 2001;38(4):310-317.
36. Dobrow R, Ganzach SY, Liu Y. Time and Job Satisfaction: A Longitudinal Study of the Differential Roles of Age and Tenure. *J Manage*. 2018;44(7):2558-2579.
37. Wright JD, Hamilton RF. Time and Job Satisfaction: A Longitudinal Study of the Differential Roles of Age and Tenure. *Soc Forces*. 1978;56(4):1140-1158.
38. Dahl SÅ, Holmås TH, Skjeret FA, Kjerstad E. En kartlegging av holdninger til sykefravær i Norden. [A survey of attitudes to sickness absence in the Nordic countries]. Bergen, Norway: Institute for Research in Economics and Business Administration; 2007.
39. Høgelund J, Holm A, Falgaard Eplov L. The effect of part-time sick leave for employees with mental disorders. *J Ment Health Policy Econ*. 2012;15(4):157.
40. Lagerveld SE, Blonk RWB, Brenninkmeijer V, Wijngaards-de Meij L, Schaufeli WB. Work-focused treatment of common mental disorders and return to work: a comparative outcome study. *J Occup. Health Psychol*. 2012;17(2):220.
41. Bethge M. Effects of graded return-to-work: a propensity-score-matched analysis. *Scand J Work Env Hea*. 2016;42(4):273-279.
42. Vooijs M, Leensen MC, Hoving JL, Daams JG, Wind H, Frings-Dresen MH. Disease-generic factors of work participation of workers with a chronic disease: a systematic review. *Int Arch Occ Env Hea*. 2015;88(8):1015-1029.
43. Campbell P, Wynne-Jones G, Muller S, Dunn KM. The influence of employment social support for risk and prognosis in nonspecific back pain: a systematic review and critical synthesis. *Int Arch Occ Env Hea*. 2013;86(2):119-137.
44. Vooijs M, Leensen MC, Hoving JL, Wind H, Frings-Dresen MH. Disease-generic factors of work participation of workers with a chronic disease: a systematic review. *Occup Environ Med*. 2015;72(11):820-826.
45. de Vries H, Fishta A, Weikert B, Sanchez AR, Wegewitz U. Determinants of Sickness Absence and Return to Work Among Employees with Common Mental Disorders: A Scoping Review. *J Occup Rehabil*. 2018;28(3):393-417.
46. Durand M-J, Vèzina N, Richard M-C. Concept of Margin of Manoeuvre in Return to Work. In Schultz IZ, Gatchel RJ: *Handbook of Return to Work: From Research to Practice*. Boston, US: Springer; 2016.

47. Markussen S, Røed K, Røgeberg O. The changing of the guards: Can family doctors contain worker absenteeism? *J Health Econ.* 2013;32(6):1230-1239.



# Appendix I





## Appendices

### Appendix A – Invitation and project description

#### **Vil du hjelpe NAV å bli bedre?**

NAV ønsker å bli bedre i oppfølgingen av deg som er sykmeldt, og derfor samarbeider NAV og NTNU i et forskningsprosjekt om hvordan vi bedre kan hjelpe deg videre. Vil du være med på dette forskningsprosjektet?

Målet er at du skal få best mulig oppfølging slik at du kan komme tilbake til arbeid så tidlig som mulig eller finne andre løsninger som er gode for deg. De som ønsker å delta blir fordelt til to grupper basert på ulike samtalemeter eller får ordinær oppfølging fra NAV.

Sykmeldte som har en sykmeldingsgrad på 50% eller mer og tilhører utvalgte NAV kontor i Trondheim får denne henvendelsen om deltagelse. Hvis du ikke lenger er sykmeldt kan du se bort i fra denne forespørselen. Dine rettigheter til ytelser eller til oppfølging fra NAV påvirkes ikke av om du velger å delta i prosjektet.

Hvis du takker «JA» til å være med i prosjektet, så er du også med i trekningen om å vinne en EL-sykkel, samt fem aktivitetsklokker av Mio Slice og fire iPad Air.

Nedenfor er det en lenke til mer informasjon om studien. Vi ber om at du leser denne før du svarer på om du ønsker å delta eller ikke. Hvis du ønsker å delta i prosjektet skriver du «Ja» i meldingsfeltet.

<https://www.nav.no/no/Lokalt/trondelag/satsinger-og-aktiviteter/foresp%C3%B8rsel-om-eltakelse-i-forskningsprosjektet>

Ved å samtykke bekrefter du at du har lest den skriftlige informasjonen i linken om forskningsprosjektet: «Bedre sykefraværsoppfølging». Din deltagelse i prosjektet gir oss verdifull informasjon og bidrar til å utvikle sykefraværsoppfølgingen i NAV.

Ønsker du å vite mer? Ta kontakt med professor Roger Hagen (48109789; [roger.hagen@ntnu.no](mailto:roger.hagen@ntnu.no)), professor Egil Fors (41236597; [egil.a.fors@ntnu.no](mailto:egil.a.fors@ntnu.no)) eller prosjektkoordinator ved NAV Heidi Fossen (91627606, [heidi.fossen@nav.no](mailto:heidi.fossen@nav.no)).

## **Forspørrel om deltakelse i forskningsprosjekt: Bedre sykefraværsoppfølging**

Dette er et spørsmål til deg om å delta i et forskningsprosjekt for å undersøke hvilke faktorer som best kan hjelpe sykmeldte tilbake i arbeid. Sykmeldte som har en sykmeldingsgrad på 50 % eller mer og tilhører utvalgte NAV kontor i Trondheim får denne henvendelsen om deltagelse. Forskningsprosjektet er et samarbeid mellom NTNU (Institutt for Samfunnsmedisin og Institutt for Psykologi) og NAV Sør-Trøndelag.

### **Hva innebærer prosjektet?**

Prosjektet undersøker om ekstra samtaler hos NAV kan hjelpe personer tilbake til arbeid. Hvis du sier ja til å bli med i denne studien, vil du bli tilfeldig fordelt til en av tre grupper. Den ene gruppen får sin vanlige oppfølging fra NAV, mens de to andre gruppene i tillegg vil bli innkalt til to samtaler ved NAV for å undersøke om dette kan virke positivt. Noen av samtalenene vil bli tatt opp og brukt i veiledning til NAV rådgivere i opplæring i ulike metoder. Alle opptak vil bli slettet etter veiledning er ferdig. Som deltager i studien vil du bli forespurt om å svare på fem spørreskjema elektronisk på ulike tidspunkt. Utfylling av disse spørreskjemaene innebærer en times samlet arbeid i løpet av et år.

### **Behandles anonymt**

Alle opplysningene vi innhenter om deg i dette prosjektet vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennerende opplysninger. En kode knytter deg til dine opplysninger. Svar fra de ulike spørreskjemaene vil bli lagret. I tillegg vil data fra NAV sitt register knyttet til utbetaling for sykepenger og andre ytelser bli innhentet. Informasjon om helsetjenesteforbruk vil bli innhentet fra HELFO/KUHR og Norsk pasientregister for bruk i helseøkonomiske analyser. Disse data vil da sammenstilles slik at man ser hvilke typer av metoder som best kan hjelpe NAV for å gi best mulig oppfølging og støtte.

### **Mulige fordeler og ulemper**

Det er ingen risiko eller bivirkninger forbundet med å delta i forskningsprosjektet. Studien ønsker å se på hvilke typer av kontakt med NAV som best kan være til hjelp for tilbakeføring i arbeid. Fordelen med å delta, er at dette kan hjelpe deg med å få en bedre helse og komme raskere tilbake i arbeid. En deltagelse innebærer ingen avvik fra den ordinære oppfølgingen du ellers hadde fått fra NAV, da studien ønsker å undersøke hvilke

tilnærminger i tillegg til ordinær oppfølging som hjelper med å redusere sykefraværet. Ulempen innebærer at du må bruke litt ekstra tid, med å fylle ut spørreskjema og økt kontakt med NAV som du ellers ikke vil ha fått hvis du ikke har vært deltager i forskningsprosjektet. Hvis du opplever at du har behov for en samtale om studien kan du kontakte professor Egil A. Fors, Institutt for samfunnsmedisin, NTNU, tlf. 412 36 597, epost: [egil.a.fors@ntnu.no](mailto:egil.a.fors@ntnu.no), eller professor Roger Hagen, Institutt for psykologi, NTNU, tlf. 481 09 789, epost: [roger.hagen@svt.ntnu.no](mailto:roger.hagen@svt.ntnu.no).

### **Frivillig deltakelse og mulighet for å trekke sitt samtykke**

Det er frivillig å delta i prosjektet. Hvis du takker ja til å være med i prosjektet, så er du også med i trekningen om å vinne en EL-sykkel, samt fem Mio Slice aktivitetsklokker og fire iPad Air. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke. Dette vil ikke få konsekvenser for din videre oppfølging fra NAV. Dersom du trekker deg fra prosjektet kan du kreve å få slettet innsamlede data og opplysninger om deg, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner. Dersom du senere ønsker å trekke deg eller har spørsmål til prosjektet er det bare å kontakte overnevnte personer.

### **Hva skjer med informasjonen om deg?**

Informasjonen som registreres om deg skal kun brukes slik som beskrevet i hensikten med studien. Du har rett til innsyn i hvilke opplysninger som er registrert om deg og rett til å få korrigert eventuelle feil i de opplysningene som er registrert hvis dette er ønskelig. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjenner opplysninger. Data du fyller ut ved hjelp av de elektroniske spørreskjema sendes kryptert til en server fra NTNU, og siden det er kode som knytter deg og dine svar på de ulike spørreskjema vil ingen direkte gjenkjenner opplysninger bli lagret ved NTNU.

Prosjektlederne har ansvar for den daglige driften av forskningsprosjektet og at opplysninger om deg blir behandlet på en sikker måte. Informasjon om deg vil bli anonymisert, vil bli analysert som gruppe og vil ikke bli brukt til å identifisere enkeltpersoner. Prosjektmedarbeiderne har taushetsplikt i henhold til Forvaltningsloven § 13. Data innhentet i forskningsprosjektet kan bli benyttet i fremtidige studier i forhold til langtidsfravær og sykemeldinger.

**Forsikring**

Det er ingen kjent risiko knyttet til de ulike metoder brukt i forskningsstudien. Gjeldende forsikringsdekning er gitt av NTNU som er selvassurandør når det gjelder forskning i regi av NTNU.

**Oppfølgingsprosjekt**

Hvis finansiering gjør det mulig, er det ønskelig at vi tar kontakt med deg igjen etter 5 år for å be deg fylle ut noen spørreskjema og innhente data fra register beskrevet ovenfor.

Deltagelse i eventuelle oppfølgingsstudier er frivillig.

**Godkjenning**

Prosjektet er godkjent av Regional komite for medisinsk og helsefaglig forskningsetikk, 2016/2300/REK sør-øst hos REK 2017.04.17.

**Forespørsel om å delta i intervju i forskningsprosjektet «Bedre sykefraværsoppfølging»**

Hei!

Dette er en forespørsel om å delta i et intervju som omhandler opplevelser og erfaringer med å være sykemeldt.

Du mottar denne e-posten fordi du har takket ja til å delta i forskningsprosjektet «Bedre sykefraværsoppfølging».

Intervjuet tar ca. 1 time og vil ta form som en uformell samtale hvor du deler dine erfaringer og opplevelser med å være sykemeldt. Se vedlagte brev for mer informasjon.

Ønsker du mer informasjon så ta gjerne kontakt med oss på tlf, 482 16 806 (Martin) eller 415 14 308 (Vegard).

Om du ønsker å bli intervjuet kan du gi tilbakemelding på en av følgende måter:

1) Fyll ut skjemaet på følgende adresse:

<https://survey.svt.ntnu.no/TakeSurvey.aspx?PageNumber=1&SurveyID=76L39643#>

2) Send en e-post til [tilbaketilarbeid@ism.ntnu.no](mailto:tilbaketilarbeid@ism.ntnu.no)

3) Send en SMS til 415 14 308.

Mvh, på vegne av prosjektgruppen

Vegard Stolsmo Foldal og Martin Inge Standal



Institutt for Samfunnsmedisin og sykepleie  
Institutt for Psykologi

## Forespørsel om å delta i intervju i forskningsprosjektet «Bedre sykefraværsoppfølging»

### Bakgrunn og hensikt

Du mottar denne forespørselen fordi du har takket ja til å delta i forskningsprosjektet «Bedre sykefraværsoppfølging». Dette er et spørsmål om å bli intervjuet om opplevelser og erfaringer med å være sykemeldt.

Formålet med intervjuet er å få vite mer om hvordan det oppleves å være sykemeldt og hvilke erfaringer folk har i møte med NAV, arbeidsgiver, nærmiljøet, venner, familie og andre. Intervjuet er ikke en del av en behandling eller et ledd i tilbakeføringen til arbeid, men vil brukes for å øke vår kunnskap om det å være sykemeldt i Norge. Denne kunnskapen vil være svært nyttig for å forbedre metodene og praksisen som i dag blir brukt for tilbakeføring til arbeid.

Studien gjennomføres av forskere ved Institutt for samfunnsmedisin og sykepleie, og Institutt for psykologi ved NTNU. Studien er godkjent av Regional komité for medisinsk og helsefaglig forskningsetikk (REK Ref. nr: 2016/2300).

### Hva innebærer intervjuet?

Intervjuet vil ta form som en uformell samtale hvor du deler dine erfaringer om formålet nevnt over. Samtalen blir tatt opp på lydfil for å sikre mest mulig pålitelig gjengivelse av det som blir sagt og vil siden bli skrevet ut som tekst for videre analyse.

### Hva skjer med informasjonen om deg?

Informasjonen om deg vil kun brukes som beskrevet i hensikten med forskningsprosjektet. Alle opplysninger du gir vil bli behandlet uten direkte gjenkjennende informasjon. Det blir ikke registrert noe sted om du deltar i intervjuet eller ikke, og du vil fortsatt kunne være med i hovedprosjektet om du velger å ikke delta i intervjuet.

Lyddoptakene fra intervjuene vil bli skrevet ut i fulltekst, og intervjuutskriftene vil bli brukt til analyser som rapporteres gjennom publiseringen av studien. Opplysninger om personer og steder vil i bli fjernet i utskriftene, slik at enkeltpersoner ikke kan gjenkjennes.

Lyddoptak, utskrifter og deltakerliste oppbevares kryptert og nedlåst under gjennomføringen av prosjektet i henhold til personopplysningsloven. Det er kun forskere ved prosjektet som har tilgang til datamaterialet. Forskerne har taushetsplikt i henhold til Helseforskningslovens §



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Institutt for Psykologi

7. Lyddopptak og deltakerlister vil bli slettet ved prosjektslutt. Utskriftene vil bli oppbevart i anonymisert form ved NTNU i 5 år etter prosjektslutt i henhold til Helseforskningsloven.

Det vil heller ikke være mulig å identifisere enkeltpersoner i publikasjoner fra studien. Resultatene fra studien vil publiseres i vitenskapelige tidsskrift, presenteres på konferanser og i populærvitenskapelige fora.

Deltakelse i intervjuet er frivillig og du er ikke forpliktet til å svare på spørsmål eller fortelle om egne opplevelser om du ikke ønsker det. Du kan når som helst trekke deg uten begrunnelse uten at dette har noen form for negative konsekvenser for deg.

### Praktisk informasjon

Om du ønsker å delta vil vi ta kontakt med deg for å avtale et egnet sted og tidspunkt for intervjuet. Intervjuet tar ca. 1 time. Reiseutgifter med billigste transportmåte eller parkering vil bli dekt ved fremvist kvittering.

### Deltakelse

Om du ønsker å delta kan du gi tilbakemelding på en av følgende måter:

- 1) Fyll ut skjemaet på følgende adresse:  
<https://survey.svt.ntnu.no/TakeSurvey.aspx?PageNumber=1&SurveyID=76L39643#>
- 2) Send en e-post til [tilbaketilarbeid@ism.ntnu.no](mailto:tilbaketilarbeid@ism.ntnu.no)
- 3) Send en SMS til 482 16 806.

Om du har noen spørsmål eller ønsker mer informasjon, ta kontakt med prosjektmedarbeider Martin Inge Standal (Tlf: 482 16 806, e-post: [martin.standal@ntnu.no](mailto:martin.standal@ntnu.no)) eller Vegard Stolsmo Foldal (Tlf: 415 14 308, e-post: [vegard.foldal@ntnu.no](mailto:vegard.foldal@ntnu.no)).

Med vennlig hilsen

Professor Egil A. Fors

Institutt for samfunnsmedisin og sykepleie

Professor Roger Hagen

Institutt for psykologi



## Samtykkeerklæring

Jeg samtykker med dette til å delta i et intervju om sykefravær og tilbakeføring til arbeid.

Min deltakelse i prosjektet er frivillig. Jeg er ikke forpliktet til å svare på spørsmål eller fortelle om egne opplevelser og erfaringer dersom jeg ikke ønsker det. Jeg kan når som helst trekke meg uten begrunnelse og uten at dette skal ha noen form for negative konsekvenser for meg.

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Sted og dato

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Navn

## Appendix C – Questionnaire

### **Initial e-mail:**

Hei!

Takk for at du valgte å delta i forskningsprosjektet «Bedre sykefraværsoppfølging»

Som en del av dette forskningsprosjektet vil du som deltager motta fem spørreundersøkelser det neste året. Spørreskjemaene varierer i lengde. Ditt bidrag på disse er svært viktig og vi setter stor pris på at du setter av tid til å svare på spørsmålene.

Datamaterialet vi får inn her vil kunne brukes til å forbedre metodene vi i dag bruker for tilbakeføring til arbeid. Alle svarene er konfidensielle og kan ikke bli brukt til å identifisere enkeltpersoner. Alle data samles og analyseres som gruppe og det er kun forskerne ved NTNU pålagt taushetsplikt som har tilgang til datamaterialet.

For å gjennomføre første spørreundersøkelse vennligst klikk på lenken under og følg instruksjonene:

#SurveyLink#

Mvh, på vegne av prosjektgruppen

Martin Inge Standal og Vegard Stolsmo Foldal

## **Follow-up e-mail:**

Hei!

For noen dager siden sendte vi deg en lenke til en spørreundersøkelse. Det er fint om du svarer på dette spørreskjemaet også hvis du ikke er lenger er sykmeldt.

For at vi skal kunne forbedre metodene som NAV bruker for sykefraværsoppfølging er det svært viktig at du fullfører dette spørreskjemaet og vi hadde derfor satt stor pris på om du kan bruke noe av din tid til dette. Om du allerede har startet på spørreskjemaet kan du fortsette der du slapp ved å bruke lenken under.

Datamaterialet vi får inn her vil kunne brukes til å forbedre metodene som brukes for sykefraværsoppfølging. Alle svarene er konfidensielle og vil ikke bli brukt til å identifisere enkeltpersoner. Alle data samles og analyseres som gruppe og det er kun forskerne ved NTNU pålagt taushetsplikt som har tilgang til datamaterialet.

For å gjennomføre spørreundersøkelsen vennligst klikk på lenken under og følg instruksjonene:

#SurveyLink#

Mvh, på vegne av prosjektgruppen

Martin Inge Standal og Vegard Stolsmo Foldal

Takk for at du valgte å delta i dette forskningsprosjektet!

Denne spørreundersøkelsen er en del av et samarbeidsprosjekt mellom NAV og NTNU med støtte fra Forskningsrådet hvor målet er å undersøke hvilken type oppfølging som best kan hjelpe sykmeldte tilbake til arbeid.

Spørreundersøkelsen tar ca. 20 minutter å gjennomføre. Ditt bidrag er svært viktig og vi setter stor pris på at du setter av tid til å svare på disse spørsmålene!

Datamaterialet i denne studien vil kunne brukes til å forbedre metodene vi i dag bruker for tilbakeføring til arbeid. Det er derfor viktig at du svarer så ærlig som mulig på spørsmålene i dette skjemaet.

Velg det svaralternativet du føler passer deg best. Svar kun med hele tall i rubrikker hvor dette spørres om (ikke bruk bokstaver, punktum, komma eller prosenttegn).

Alle svarene er konfidensielle og vil ikke bli brukt til å identifisere enkeltpersoner. All data samles og analyseres som gruppe.

Hvis du har noen spørsmål, ta kontakt med Professor Roger Hagen på telefon (481 09 789) eller e-post (roger.hagen@ntnu.no).

**1. Kjønn**

- Mann  
 Kvinne

**2. Alder**

**3. Sivil status**

- Enslig  
 Kjæreste, men ikke samboende  
 Gift / samboer  
 Skilt / separert  
 Enke / enkemann

**4. Antall hjemmeboende barn**

**5. Høyeste fullførte utdanning**

- Ikke fullført grunnskole  
 Grunnskole  
 Gymnas / Videregående skole  
 Yrkeskole  
 Høyskole / Universitet (inntil 3 år)  
 Høyskole / Universitet (over 3 år)  
 Doktorgrad

**6. Hva er din årlige bruttolønn? (Lønn før skatt)**

7. Hvor mange år har du vært i arbeidslivet?

8. Hvor stor stillingsandel i prosent hadde du før du ble sykmeldt? (Hvis du har flere jobber angir du totalen. Hvis du ikke har jobb skriver du 0)

9. Hvilken type virksomhet arbeider du i?

- Offentlig sektor
- Privat sektor
- Vet ikke / usikker

10. Hvis du er i arbeid, hvordan vil du beskrive arbeidet ditt?

- For det meste stillesittende arbeid.
- Arbeid som krever at du går mye.
- Arbeid hvor du går og løfter mye.
- Tungt kroppsarbeid.
- Vet ikke / usikker.

11. Har du skiftarbeid eller jobber i turnus?

- Ja
- Nei

12. Hvor mange år har du jobbet i skiftarbeid eller turnus?

13. Har du tidligere i ditt arbeidsliv vært sykemeldt over 8 uker?

- Ja
- Nei

14. Hvor mange ganger har du vært sykemeldt over 8 uker i løpet av de siste tre år?

15. Hvis du har vært sykemeldt tidligere, hvor lenge varte din lengste sykemeldingsperiode?

- Mindre enn 2 uker
- 2-8 uker
- 9 uker til 6 måneder
- 7-12 måneder
- Jeg har ikke vært sykemeldt tidligere

16. Har du søkt om uføretrygd?

- Ja
- Nei



27. I hvor stor grad synes du at arbeidsplassen din gir muligheter for tilrettelegging av ditt arbeid? (1 er svært liten grad og 10 er i svært stor grad)

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. I hvor stor grad kan du selv planlegge ditt eget arbeid? (1 er i svært liten grad og 10 er i svært stor grad)

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. Hvordan ser du på din husholdnings økonomiske situasjon?

- Anstrengt  
 Uanstrengt

30. Hvor stor tiltro har du til at du vil vende tilbake til arbeidslivet? (hvor 1 er ikke tiltro i det hele tatt og 10 er meget høy tiltro)

1 - ikke tiltro i det hele tatt	2	3	4	5	6	7	8	9	10 - meget høy tiltro
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. Hvor viktig er det for deg å vende tilbake til arbeidslivet? (hvor 1 er ikke viktig i det hele tatt og 10 er utrolig viktig)

1 - ikke viktig i det hele tatt	2	3	4	5	6	7	8	9	10 - utrolig viktig
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. På en skala fra 1-10, hva er dine forventninger til at den hjelpen NAV kommer til å gi deg vil hjelpe deg tilbake til arbeid?

1 - ingen forventninger	2	3	4	5	6	7	8	9	10 - store forventninger
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tilbake

Neste

33. Hvordan er helsen din nå?

- Dårlig  
 Ikke helt god  
 God  
 Svært god

34. Vennligst velg den boksen som best angir hvor sterke smerter du har hatt i gjennomsnitt **den siste uken**.

0 - ingen smerter	1	2	3	4	5	6	7	8	9	10 - verst tenkelige smerter
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. Hvis du har helseplager, tror du at helseplagene skyldes ditt arbeid?

- Ja  
 Nei  
 Vet ikke

36. Tenker du at smerte er farlig eller skadelig for deg?

- Ja  
 Nei  
 Vet ikke

37. Tenker du at du må være fullstendig smertefri før du kan begynne på jobb igjen?

- Ja  
 Nei  
 Vet ikke

38. Tenker du at det er best å holde deg i ro, slik at smerten ikke blir verre?

- Ja  
 Nei  
 Vet ikke

39. Tenker du at smerten din kan kontrolleres på noen måte?

- Ja  
 Nei  
 Vet ikke

40. På en skala fra 1-10, hvor utmattet føler du deg?

1 - ikke utmattet i det hele tatt	2	3	4	5	6	7	8	9	10 - veldig utmattet
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. Det at jeg er sliten og uopplagt virker inn på mitt arbeid, mitt familieliv eller min omgang med venner og kjente

1 - Helt uenig	2	3	4	5	6	7 - Helt enig
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

42. Hvor lenge tror du at du vil være sykmeldt fra i dag? (NB: Bruk tall, og ikke bokstaver i ruten under.)

I antall måneder	Jeg tror ikke jeg kommer tilbake i jobb
<input type="text"/>	<input type="text"/>

Tilbake

Neste



43. Uttalelsene nedenfor er knyttet til dine forventninger til arbeid. Se for deg at du skal være i fullt arbeid i din **nåværende jobb fra i morgen av**, med din nåværende fysiske og psykiske helse. Vennligst fyll ut disse enten du er sykmeldt eller i arbeid.

0 = Helt uenig | 5 = Helt enig

	0 - Helt uenig	1	2	3	4	5 - Helt enig
Jeg vil mestre tilbakeslag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil ikke være i stand til å fullføre mine arbeidsoppgaver på grunn av min psykiske tilstand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å sette grenser for meg selv på jobben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å utføre mine oppgaver på jobben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å håndtere emosjonelt krevende situasjoner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil ikke ha energi igjen til noe annet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å konsentrere meg på jobb	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å mestre arbeidspress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å håndtere potensielle problemer på jobben	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg kan motivere meg selv til å utføre min jobb	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg vil være i stand til å mestre fysiske krav jobben stiller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tilbake

Neste

Under hvert spørsmål ber vi deg velge den boksen som best beskriver helsen din I DAG.

44. Gange:

- Jeg har ingen problemer med å gå omkring
- Jeg har litt problemer med å gå omkring
- Jeg har middels store problemer med å gå omkring
- Jeg har store problemer med å gå omkring
- Jeg er ute av stand til å gå omkring

45. Personlig stell:

- Jeg har ingen problemer med å vaske meg eller kle meg
- Jeg har litt problemer med å vaske meg eller kle meg
- Jeg har middels store problemer med å vaske meg eller kle meg
- Jeg har store problemer med å vaske meg eller kle meg
- Jeg er ute av stand til å vaske meg eller kle meg

46. Vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- eller fritidsaktiviteter):

- Jeg har ingen problemer med å utføre mine vanlige gjøremål
- Jeg har litt problemer med å utføre mine vanlige gjøremål
- Jeg har middels store problemer med å utføre mine vanlige gjøremål
- Jeg har store problemer med å utføre mine vanlige gjøremål
- Jeg er ute av stand til å utføre mine vanlige gjøremål

47. Smerter/Ubehag:

- Jeg har verken smerter eller ubehag
- Jeg har litt smerter eller ubehag
- Jeg har middels sterke smerter eller ubehag
- Jeg har sterke smerter eller ubehag
- Jeg har svært sterke smerter eller ubehag

48. Angst/Depresjon:

- Jeg er verken engstelig eller depriment
- Jeg er litt engstelig eller depriment
- Jeg er middels engstelig eller depriment
- Jeg er svært engstelig eller depriment
- Jeg er ekstremt engstelig eller depriment

49.

- Vi vil gjerne vite hvor god eller dårlig helsen din er I DAG.
- Denne skalaen er nummerert fra 0 til 100.
- 100 betyr den beste helsen du kan tenke deg.
- 0 betyr den dårligste helsen du kan tenke deg.
- Velg det tallet på skalaen som best representerer helsen din I DAG.

Tilbake

Neste







76. Overfor andre mennesker, er vi i vår familie

1 - lite støttende overfor hverandre	2	3	4	5	6	7 - lojale overfor hverandre
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

77. Jeg får støtte fra

1 - venner / familie	2	3	4	5	6	7 - ingen
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

78. Hendelser i livet som jeg vanskelig kan gjøre noe med

1 - klarer jeg å infinne meg med	2	3	4	5	6	7 - er en stadig kilde til bekymring
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

79. Å komme på gode samtaleemner synes jeg er

1 - vanskelig	2	3	4	5	6	7 - enkelt
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

80. I familien min liker vi å

1 - finne på fellesaktiviteter	2	3	4	5	6	7 - gjøre ting hver for oss
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

81. Når det trengs, har jeg

1 - aldri noen som kan hjelpe meg	2	3	4	5	6	7 - alltid noen som kan hjelpe meg
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

82. Mine nære venner/familiemedlemmer

1 - verdsetter egenskapene mine	2	3	4	5	6	7 - misliker egenskapene mine
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tilbake

Neste

83. Vær vennlig å angi hvor store vansker du har med søvnen nå for tiden (**de siste 2 ukene**)?

	Ingen	Milde	Moderate	Alvortlige	Veldige
a. Vansker med å sovne inn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Vansker med å holde meg sovende	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Vansker med at jeg våkner for tidlig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

84. Hvor fornøyd / misfornøyd er du med ditt nåværende søvnmønster?

- Veldig fornøyd
- Fornøyd
- Nøytral
- Misfornøyd
- Veldig misfornøyd

85. I hvilken grad mener du at ditt søvnproblem forstyrrer din daglige fungering (for eksempel tretthet på dagtid, evne til å fungere på arbeid / daglige gjøremål, konsentrasjon, hukommelse, humør, etc.)?

- Forstyrrer ikke i det hele tatt
- Litt
- Noe
- Mye
- Forstyrrer i veldig stor grad

86. Hvor synlig tror du det er for andre at du har søvnproblemer som svekker din livskvalitet?

- Ikke synlig i det hele tatt
- Litt
- Noe
- Mye
- Synlig i veldig stor grad

87. Hvor bekymret / plaget er du over ditt nåværende søvnproblem?

- Ikke bekymret i det hele tatt
- Litt
- Noe
- Mye
- Bekymret i veldig stor grad

Tilbake

Neste

88. Hvor ofte har du vært plaget av de følgende problemene i løpet av **de siste to ukene**?

	Ikke i det hele tatt	Noen dager	Mer enn halvparten av dagene	Nesten hver dag
1. Følt deg nervøs, engstelig eller på tuppet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ikke klart å stoppe eller kontrollere bekymringene dine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Bekymret deg for mye om ting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Hatt vansker med å slappe av	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Vært så rastløs at det har vært vanskelig å sitte stille	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Blitt lett irritert eller ergret deg over ting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Følt deg redd som om noe forferdelig kunne komme til å skje	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

89. Hvis du har opplevd ett eller flere av de problemene som nevnes, i hvor stor grad har problemene gjort det vanskelig for deg å utføre arbeidet ditt, ordne med ting hjemme eller å komme overens med andre?

- Ikke vanskelig i det hele tatt  
 Litt vanskelig  
 Svært vanskelig  
 Ekstremt vanskelig

90. Hvor ofte har du vært plaget av ett eller flere av de følgende problemene i løpet av **de siste to ukene**?

	Ikke i det hele tatt	Noen dager	Mer enn halvparten av dagene	Nesten hver dag
1. Liten interesse for eller glede av å gjøre ting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Følt deg nedfor, deprimert eller fylt av håpløshet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Vansker med å sovne, sove uten avbrudd eller sovnet for mye	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Følt deg trett eller energiløs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Dårlig matlyst eller å spise for mye	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Vært misfornøyd med deg selv eller følt deg mislykket, eller følt at du har sviktet deg selv eller familien din	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Vansker med å konsentrere deg om ting, slik som å lese avisen eller se på tv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Beveget deg eller snakket så langsomt at andre kan ha merket det? Eller motsatt - følt deg så urolig eller rastløs at du har beveget deg mye mer enn vanlig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Tanker om at det ville vært bedre om du var død eller om å skade deg selv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

91. Hvis du har opplevd ett eller flere av de problemene som nevnes, i hvor stor grad har problemene gjort det vanskelig for deg å utføre arbeidet ditt, ordne med ting hjemme eller å komme overens med andre?

- Ikke vanskelig i det hele tatt  
 Litt vanskelig  
 Svært vanskelig  
 Ekstremt vanskelig



Under kommer 4 spørsmål om alkoholbruk gjennom livet.

Svar så ærlig som mulig, ved å markere det alternativet som gjelder for deg.

**92.** Har du noen gang tenkt at du burde drikke mindre?

- Ja  
 Nei

**93.** Har du blitt irritert over at andre har kritisert drikkevanene dine?

- Ja  
 Nei

**94.** Har du noen gang hatt skyldfølelse på grunn av alkoholbruken din?

- Ja  
 Nei

**95.** Har det noen gang hendt at du har startet dagen med å drikke alkohol for å roe nervene eller bli kvitt bakrusen?

- Ja  
 Nei

Tilbake

Ferdig

Appendix D – Initial list of prognostic factors and reviews

<b>Prognostic factor</b>	<b>Authors</b>	<b>Outcome</b>	<b>Sample</b>
<b>Activity / functional limitations</b>	Cancelliere et al. (2016)	RTW	Any
	Lagerveld et al. (2010)	Work participation	Depression
	Peters et al. (2016)	RTW	CTS
	Vooijs et al. (2015)	RTW	Chronic disease
<b>Age</b>	Detaille et al. (2009)	Disability	Other
	Cancelliere et al. (2016)	RTW	Any
	Ervasti et al. (2017)	RTW	Depression
	Nigatu et al. (2017)	RTW	CMD
	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Peters et al. (2016)	RTW	CTS
	Steenstra et al. (2016)	RTW	MSK
	Steenstra et al. (2005)	RTW	MSK
	Mbengi et al. (2016)	RTW	Cancer
	Valentin et al. (2017)	Disability	Pain
	Ansoleagga et al. (2015)	RTW	CMD
	Vooijs et al. (2015)	RTW	Chronic disease
	Street & Lacey (2015)	RTW	Injury
	Streitbelt & Egner (2013)	RTW	Any
<b>Anxiety</b>	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Dujits et al. (2014)	Work ability	Cancer
<b>Catastrophizing</b>	de Wit et al. (2018)	Work participation	Any
	Wertli et al. (2014)	Disability	MSK
<b>Cognitive limitations</b>	Dujits et al. (2014)	Work ability	Cancer
<b>Comorbidity</b>	Lagerveld et al. (2010)	Work participation	Depression
	Ervasti et al. (2017)	RTW	Depression
	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Vooijs et al. (2015)	RTW	Chronic disease
	Garrelfs et al. (2015)	RTW	Comorbid ABI/PD
<b>Control (pain)</b>	Waddell et al. (2003)	Disability	Any
	de Wit et al. (2018)	Work participation	Any
<b>Coping</b>	Dujits et al. (2014)	Work ability	Cancer
<b>Dependants</b>	Street & Lacey (2015)	RTW	Injury

<b>Depression</b>	Cancelliere et al. (2016)	RTW	Any
	Lagerveld et al. (2010)	Work participation	Depression
	Gagnano et al. (2018)	RTW	CMD, CVD, Cancer
	Islam et al. (2014)	RTW	Cancer
	Dujits et al. (2014)	Work ability	Cancer
	Waddell et al. (2003)	Disability	Any
<b>Distress</b>	Mbengi et al. (2016)	RTW	Cancer
	Islam et al. (2014)	RTW	Cancer
	Waddell et al. (2003)	Disability	Any
<b>Education</b>	Cancelliere et al. (2016)	RTW	Any
	Gagnano et al. (2018)	RTW	CMD, CVD, Cancer
	Steenstra et al. (2016)	RTW	MSK
	Mbengi et al. (2016)	RTW	Cancer
	Islam et al. (2014)	RTW	Cancer
	Street & Lacey (2015)	RTW	Injury
	Cancelliere et al. (2014)	RTW	mTBI
<b>Ethnicity</b>	Islam et al. (2014)	RTW	Cancer
<b>Fatigue</b>	Mbengi et al. (2016)	RTW	Cancer
	Islam et al. (2014)	RTW	Cancer
	Dujits et al. (2014)	Work ability	Cancer
<b>Fear avoidance behavior</b>	de Wit et al. (2018)	Work participation	Any
	Steenstra et al. (2016)	RTW	MSK
	Waddell et al. (2003)	Disability	Any
<b>Gender</b>	Cancelliere et al. (2016)	RTW	Any
	Steenstra et al. (2016)	RTW	MSK
	Steenstra et al. (2005)	RTW	MSK
	Detaille et al. (2009)	Disability	Other
	Street & Lacey (2015)	RTW	Injury
	van Muijen et al. (2013)	RTW	Cancer
<b>Graded leave</b>	Vargas-Prada et al. (2017)	RTW	ANY
<b>Health</b>	de Wit et al. (2018)	Work participation	Any
	Rashid et al. (2017)	RTW	MSK
	Gagnano et al. (2018)	RTW	CMD, CVD, Cancer
	Steenstra et al. (2016)	RTW	MSK
	Detaille et al. (2009)	Disability	Other
	Islam et al. (2014)	RTW	Cancer
	Streitbelt & Egner (2013)	RTW	Any

	Waddell et al. (2003)	Disability	Any
<b>Illness severity</b>	Cancelliere et al. (2016)	RTW	Any
	Lagerveld et al. (2010)	Work participation	Depression
	Mbengi et al. (2016)	RTW	Cancer
	Valentin et al. (2017)	Disability	Pain
	Vooijs et al. (2015)	RTW	Chronic disease
	Street & Lacey (2015)	RTW	Injury
	Cancelliere et al. (2014)	RTW	mTBI
	Shi et al. (2014)	RTW	THI
	Wang et al. (2014)	RTW	Stroke
	van Muijen et al. (2013)	RTW	Cancer
<b>Income</b>	Peters et al. (2016)	RTW	CTS
	Shi et al. (2014)	RTW	THI
	Streitbelt & Egner (2013)	RTW	Any
<b>Job control</b>	Gagnano et al. (2018)	RTW	CMD, CVD, Cancer
<b>Job satisfaction</b>	Waddell et al. (2003)	Disability	Any
<b>Marital status</b>	Street & Lacey (2015)	RTW	Injury
<b>Mental health status</b>	Peters et al. (2016)	RTW	CTS
<b>Motivation</b>	de Wit et al. (2018)	Work participation	Any
	Ansoleagga et al. (2015)	RTW	CMD
<b>Optimism</b>	de Wit et al. (2018)	Work participation	Any
<b>Pain</b>	Cancelliere et al. (2016)	RTW	Any
	Steenstra et al. (2016)	RTW	MSK
	Mbengi et al. (2016)	RTW	Cancer
	Valentin et al. (2017)	Disability	Pain
	Vooijs et al. (2015)	RTW	Chronic disease
	Wertli et al. (2014)	Disability	MSK
	Waddell et al. (2003)	Disability	Any
<b>Physical work</b>	Steenstra et al. (2005)	RTW	MSK
	Mbengi et al. (2016)	RTW	Cancer
	Detaille et al. (2009)	Disability	Other
	Islam et al. (2014)	RTW	Cancer
	van Muijen et al. (2013)	RTW	Cancer
<b>Previous sick leave</b>	Cancelliere et al. (2016)	RTW	Any
	Lagerveld et al. (2010)	Work participation	Depression
	Peters et al. (2016)	RTW	CTS

<b>Psychosocial work environment</b>	Peters et al. (2016)	RTW	CTS
	Ansoleagga et al. (2015)	RTW	CMD
	Vooijs et al. (2015)	RTW	Chronic disease
	Waddell & Kim (2004)	RTW	Any
<b>Recovery beliefs / expectations</b>	Rashid et al. (2017)	RTW	MSK
	Peters et al. (2016)	RTW	CTS
	Street & Lacey (2015)	RTW	Injury
<b>RTW Expectations</b>	Cancelliere et al. (2016)	RTW	Any
	Steenstra et al. (2016)	RTW	MSK
	Waddell et al. (2003)	Disability	Any
<b>Self-efficacy</b>	Cancelliere et al. (2016)	RTW	Any
	de Wit et al. (2018)	Work participation	Any
	Black et al. (2018)	RTW	MSK, CMD
	Nigatu et al. (2017)	RTW	CMD
	Ansoleagga et al. (2015)	RTW	CMD
<b>Socioeconomic status</b>	Cancelliere et al. (2016)	RTW	Any
	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Steenstra et al. (2016)	RTW	MSK
	Ansoleagga et al. (2015)	RTW	CMD
<b>Social function</b>	Steenstra et al. (2005)	RTW	MSK
<b>Social support</b>	Islam et al. (2014)	RTW	Cancer
	Campbell et al. (2013)	RTW	MSK
<b>Supervisor support</b>	Ansoleagga et al. (2015)	RTW	CMD
	Islam et al. (2014)	RTW	Cancer
<b>Work accomodation</b>	Nogawa & Kojimahara (2018)	Recurrent sickness absence	Any
	Peters et al. (2016)	RTW	CTS
	Vargas-Prada et al. (2017)	RTW	Any
	Donker-Cools et al. (2016)	RTW	ABI
	Ansoleagga et al. (2015)	RTW	CMD
<b>Work autonomy</b>	Cancelliere et al. (2014)	RTW	mTBI
<b>Work (dis)ability / capacity</b>	Lagerveld et al. (2010)	Work participation	Depression

	Rashid et al. (2017)	RTW	MSK
	Nigatu et al. (2017)	RTW	CMD
	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Steenstra et al. (2005)	RTW	MSK
	Valentin et al. (2017)	Disability	Pain
<b>Work demands / strain</b>	Cancelliere et al. (2016)	RTW	Any
	Gragnano et al. (2018)	RTW	CMD, CVD, Cancer
	Peters et al. (2016)	RTW	CTS
	Steenstra et al. (2016)	RTW	MSK
<b>Workplace interventions</b>	van Vilsteren et al. (2015)	RTW	Any

*RTW: Return to work. Other: Rheumatoid arthritis, asthma, chronic obstructive pulmonary disease, diabetes mellitus, and ischemic heart disease. CMD: Common mental disorders. CVD: Cardiovascular disorders. MSK: Musculoskeletal disorder. mTBI: Mild traumatic brain injury. ABI: Acquired brain injury. PD: Psychiatric disorder. CTS: Carpal tunnel syndrome. THI: Traumatic hand injury.*

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