

ORIGINAL ARTICLE

## Describing patients with a duration of sick leave over and under one year in Norway

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### Abstract

**Objective:** This study aimed to describe the somatic, social, psychological, and work-related factors that characterize participants with a duration of sick leave over and under one year. **Methods:** During 2012, 181 patients on long-term sick leave were consecutively recruited and asked to answer an extensive survey. Several outcomes were reported, addressing work-related factors and somatic, psychological, and social symptoms. In cross-sectional analyses, sick leave duration was dichotomized as > or < one year, based on Norwegian legislation. Linear and logistic regressions were used to estimate population probabilities and means. **Results:** The estimated prevalence of pain, fatigue, anxiety, and depression was overall high. There was a tendency towards a higher prevalence of fatigue, anxiety, and depression in those with sick leave duration less than one year, with the exception of sleep problems, which was more frequent in the population with longer duration. Relationship with friends, family, co-workers, and the last workplace were worse in the population with longer duration. **Conclusions:** Cross-sectional analyses indicated that social and work-related problems are more adverse in patients with longer duration of sick leave, while psychological and somatic symptoms appear less adverse. This is one of the first studies quantitatively demonstrating these differences through comprehensive, simultaneously measured self-report questionnaires.

**Key words:** work-related factors, social factors, sick leave duration, return-to-work, rehabilitation

### Introduction

Consequences and causes of long-term sick leave are a common concern in Western countries, perhaps especially in Norway. Around 6% of the total workforce in Norway is currently on sick leave and approximately 9.5% of the working-age population receive disability pension (1). Norway spends 5% of its gross domestic product on disability and sickness benefits, which is far more than any other OECD country (2).

In addition to fiscal concerns, long-term sick leave has been associated with increased risk for mortality (3), suicide (3), social isolation (4), and lowered socio-economic status (5). This has influenced the authorities in Norway, as well as other Western countries, to prioritize return-to-work rehabilitation programmes (5,6).

When people are on sick leave in Norway, a general practitioner (GP) will in most cases treat illness and complaints, and cooperate with the employer and the

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National Insurance Offices (NIO) in an attempt to facilitate their return to work. Patients in need of additional treatment or support may be referred to return-to-work rehabilitation. Benefits are given from the first day of sick leave to a maximum of 52 weeks and are relatively close to the income from full employment. If the worker still has significantly reduced work ability at the one-year mark, and this is related to sickness, injury, or inborn conditions (e.g. intellectual disability), the worker can receive “work ability assessment benefit” (WAB). If the worker is transferred to WAB, benefits and payments are reduced to two-thirds of the original salary. At this time the employer is also legally allowed to terminate the employment contract. As such, the one-year mark represents a selection from an incentive point of view, and represents a natural cut-off in the Norwegian sick-leave process.

Though prioritized, the effective assessment, treatment, and rehabilitation of disorders justifying sick leave has proved challenging (7). As an example, the dominant diagnostic categories justifying sick leave in Norway are well known (musculoskeletal disorders [33%] and mental disorders [20%]) (1). But, as several studies have demonstrated, in these disorders comorbidity and overlap seems to be the rule, rather than the exception (5).

The Sherbrooke model has long been considered a landmark in the treatment and rehabilitation of disorders leading to long-term sick leave (8). This model views return to work as dependent on a combination of factors, including individual factors, family factors, health care provider, and social insurance agency (8). A salient example of such factors in the current study is the individual factor of reduced payment when moving from sick leave to WAB. This reduction could be viewed as a strong incentive to return to work irrespective of successful rehabilitation and/or health-related factors. Hence, the Sherbrooke study and treatment model influenced a shift in the field of occupational rehabilitation (9), moving away from the biomedical treatment of specific diseases towards multidisciplinary rehabilitation spanning many social, individual, and health-related factors (10).

Although such return-to-work-rehabilitation models have emphasized the importance of societal, compensatory, social, and workplace factors, the impact of such factors may be underestimated since only somatic and mental disorders are regarded as legitimate reasons for sick leave. In addition, it has proved difficult to quantify and measure the impact of such factors, often making them less dominant in research (11,12).

Several studies have attempted to address this by including one or several psychosocial work-related variables when investigating long-term sick leave and/or disability pension, but so far they are somewhat lacking with regard to societal and family factors

(13-16). This has led to a recent systematic review on disability pension, expressing a need for studies where the individuals causation is put in an extensive context, measuring illness, psychosocial factors, workplace factors, sleep, and cognitive dysfunction simultaneously (11).

Studies are lacking that investigate whether it is sickness, societal, or psychosocial/work-related factors that are most prominent in groups at risk for prolonged disability (11). In addition, several studies highlight the need for knowledge on how different social, medical, and mental factors develop in relation to each other during an extended period of sick leave. This need is underlined through studies showing that the longer duration of sick leave one has before receiving rehabilitation, the less likely one is to achieve return to work (17,18).

The current study proposed to use a comprehensive assessment of patients on long-term sick leave of different duration to investigate and describe symptom profiles. The aim of this study was twofold. First, to present a broad overview of somatic, psychological, and social symptoms, as well as work-related factors in a population of patients on long-term sick leave. Second, to investigate symptom profiles in patients who have been sick listed for one year or less, and those who have been on sick leave longer than one year.

It was hypothesized that the group with a duration of more than one year would report more somatic, psychological, and social symptoms when compared with the group with a duration of less than one year. The assumption was that they represent a population too sick to return to work, despite reduced benefits.

## Material and methods

### *Participants*

During 2012, GPs referred patients between 18 and 59 years of age to a 3.5-week inpatient intervention at an occupational rehabilitation centre. The GPs were instructed that patients had to have been on sick leave longer than eight weeks, due to musculoskeletal pain, fatigue, and/or mental disorders. The participants were expected to have first tried rehabilitation on the lowest effective level of care. This is a written principle in the Norwegian health care system (19). For the participant, this entailed for example trying local physical therapy or trying a pharmaceutical regimen administered by the GP, before being referred to rehabilitation in specialist care. Many of the referred participants had therefore been on sick leave for a long time.

Participants were excluded if they had a severe mental disorder (acute psychosis, an ongoing manic episode, or suicidal ideation), were not able to

communicate in Norwegian, or were pregnant. Participants met with a physician, a psychologist, and a physical therapist at a designated outpatient clinic to be examined, before participating in the intervention. Prior to this examination, the participants filled out an extensive web-based survey. This survey had measures of socio-demographics, pain, fatigue, mental distress, sleep problems, memory problems, and fear-avoidance measures. Participant flow is described in Figure 1. The data from the survey were used as a single-source tool for the inpatient clinic, and were simultaneously included in a research database. The Regional Committee for Ethics in Medical Research approved the study.

### The rehabilitation programme

The occupational rehabilitation programme was group-based with up to eight participants in each group. However, the programme used both group-based and individual approaches to facilitate rehabilitation. The programme was organized through seven-hour workdays and lasted a total of 17 workdays. The occupational therapists were coined return-to-work coordinators and targeted three areas of rehabilitation: mental training, physical training, and work-related problem-solving. The team of coordinators had extensive and diverse academic backgrounds (e.g. physical therapy, psychology, exercise physiology, nursing), and each coordinator was responsible for mentoring two or three participants through the programme. There were three multidisciplinary team meetings during the inpatient stay where the coordinators discussed possible strategies for handling the participants' obstacles and possibilities with regard to returning to work.

### Study design

This study had a cross-sectional design with a consecutively recruited sample from an occupational rehabilitation setting in Norway.

### Independent variable

*Sick leave duration* was assessed through a question asking participants "How long has it been since you participated in paid work?". The response alternatives were: "Never"; "One year or less"; "Two years"; "Three years"; "Four years"; or "Five years or more". Based on the distribution of participants and the legislative NIO process, the variable was dichotomized into "One year or less" and "More than one year". Those who answered "Never" were excluded from the analysis. Using self-report as a measure of receiving benefits has been validated for a Norwegian population (20).

### Descriptive variables and covariates

The participant's demographics were reported through a standardized set of questions validated in a large Norwegian cohort (21): *age* (What is your age?); *sex* (What is your sex?); *height* (What is your height?); *weight* (What is your weight?); *relationship status* (What is your relationship status? Not married; married; living with partner; widowed; divorced; separated); and *education* (What is your highest level of education? Elementary school; high school; craft certificate; unfinished education; college/university up to 4 years; college/university over 4 years; other). The participant's *relationship with NIO* was measured by one item asking, "How is your relationship with the NIO? (Very Bad; Bad; Fairly Good; Good and Excellent)". This variable was trichotomized (bad, good, and excellent) to better reflect the differences reported by participants since distribution was clustered around these items.

### Dependent variables

*Fatigue* was measured with the Chalder Fatigue Questionnaire (22), which consists of 11 questions reflecting physical and mental fatigue. Later, the scale was

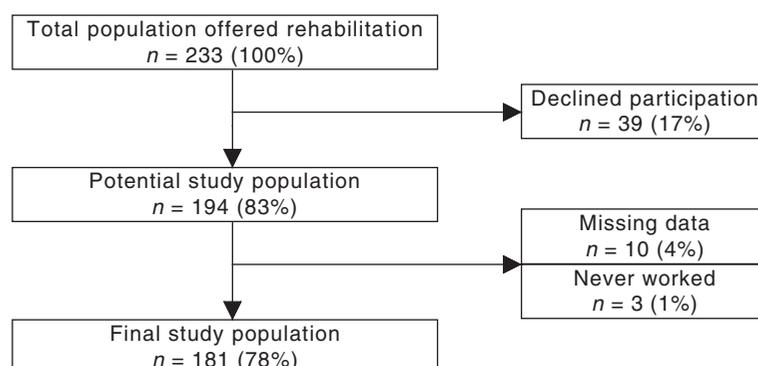


Figure 1. Flow of participants invited to occupational rehabilitation during 2012.

revised to include two items pertaining to extent and duration (23). Each item has four response categories, which are scored 0–0–1–1. The items are summed and yield a scale of 0–11. This 13-item scale has been validated for a Norwegian population, and has a cut-off on symptom intensity (5, lasting for six months or more (23).

The Hospital Anxiety and Depression Scale (HADS) (24) provide scores for symptoms of *anxiety and depression*. The 14-item scale with each item ranging from 0 to 3 yields separate scores for anxiety and depression, which are summed. A score (8 on either subscale was used to indicate mental distress as validated for a Norwegian population (25).

The Insomnia Severity Index (26) (ISI) is a seven-item questionnaire evaluating the nature, severity, and impact of *sleep problems*. A five-point (0–4) Likert scale rates difficulties falling asleep, night-time awakenings, early morning awakenings, impairment of daytime functioning due to sleep problems, notice ability of impairments, distress or worry caused by sleep difficulties, and dissatisfaction with sleep. The items were summed, giving a scale of 0–28, where (15 was used as a cut-off indicating problems with insomnia (27).

A consensus team of two experienced occupational psychologists created the Psychosocial Assessment Instrument (PAI) to address psychosocial factors that could predict the course of functional somatic symptoms (28). This instrument includes 10 items (range 0–3) measuring the participant's *relationship with their colleagues and their last workplace*. These items were summed and scaled (0–30). A higher score indicated a better relationship. This instrument also included two items (1–6) assessing the participant's *relationship with their friends and family*. These items were also summed and scaled (1–12), and a higher score indicates a better relationship.

*Fear-avoidance towards work* was measured through the Fear Avoidance Beliefs Questionnaire (FABQ) – Work Subscale (29). The work-related subscale in the FABQ questionnaire consists of 11 items measuring the participant's subjective experience of fear and attribution of injury to the workplace. These items are summed yielding a scale from 0 to 66, with a higher score indicating a worse fear of re-injury (29).

*Chronic pain* was measured with an item from SF-8 (30) asking “How much bodily pain have you had in the last week? (None, very mild, mild, moderate, severe, very severe)”. This scale has been validated as a proxy measure of chronic pain in Norwegian population studies, using a cut-off of (moderate (31). This cut-off was used in this study to indicate pain/no pain in the initial analyses.

*Pain intensity* was measured with an item from the Brief Pain Inventory (BPI) that consists of several items evaluating chronic pain (32). The

item asked the participant to rate how their average pain had felt in the last week. The items were scored from 0 to 10 with 0 representing “no pain” and 10 the “worst pain imaginable”. The reported score on average pain was used as an indicator of pain intensity in this study.

Short Form-36 (33) consists of 36 items that measure subjective experience of functional status, well-being, and overall evaluation of health through eight subscales. This study used the *physical function* subscale of SF-36.

*Physical activity and fear-avoidance* was measured with five items from the physical activity subscale of FABQ (29). It gives a subjective evaluation of the participant's attribution and avoidance with regard to pain and physical activity. Each item was scored from 0 to 6 and summed, yielding a scale from 0 to 30. A higher score indicates more fear and avoidance.

The Pain Catastrophizing Scale (34) is a 13-item scale where the participants report their *catastrophic thoughts about pain*. Catastrophizing has been found to be important in coping with pain (35). Each item is scored on a scale of 0–4, which is summed, yielding a scale of 0–52. A higher score indicates more catastrophizing thoughts.

*Everyday memory problems* were measured with the Everyday Memory Questionnaire – revised (36), which is a 13-item scale with five response alternatives (0–4) designed to measure subjective memory failure in daily life. The scale was summed yielding a score from 0 to 52.

#### Data analyses

In initial analyses, characteristics were reported for the two groups of sick leave duration ( $>$  or  $\leq$  1-year) as mean (standard deviation, or frequency and percentage). To investigate the association between sick leave duration and all outcomes, the ordinal variables with validated cut-offs were dichotomized, while outcome variables without a validated cut-off were kept ordinal, but analysed as continuous. The following dependent variables were dichotomized: *fatigue, depression, anxiety, and sleep problems*, and the following dependent variables were kept continuous: *work relationships, physical activity, familial relationships, pain intensity, fear-avoidance PA, fear-avoidance work, everyday memory problems, and pain catastrophizing*. Four multivariable logistic regression models and eight multivariable linear regression models were built to investigate associations. The analyses were adjusted for selected socio-demographics (age, gender, marital status, education, and BMI). These covariates were determined a priori based on knowledge about factors affecting long-term sick leave (11). Odds ratios (OR) and coefficients ( $\beta$ ) were both reported with 95%

Table I. Characteristics of participants who reported being on sick leave &gt; 1 year receiving occupational rehabilitation during 2012.

Characteristics	Sick leave < 1 year (n = 122)	Sick leave > 1 year (n = 59)
Age (yrs)	42.6 (10.5)	41.3 (9.4)
Gender:		
Male	23 (18.9%)	18 (30.5%)
Female	99 (81.9%)	41 (69.5%)
Marital status:		
Single/living alone	37 (30.3%)	24 (40.7%)
Married/living with partner	85 (69.7%)	35 (59.3%)
Education:		
Less than high school	15 (12.4%)	15 (25.4%)
High school	51 (42.1%)	15 (25.4%)
Some college/university	39 (32.2%)	22 (37.3%)
Any college/university degree	16 (13.2%)	7 (11.9%)
Type of benefit:		
0–100% paid sick leave	69 (56.6%)	7 (11.9%)
Work Assessment Benefit*	48 (39.3%)	49 (83.1%)
0–100% disability	3 (2.5%)	3 (5.1%)
Sleep problems:		
Yes	42 (34.7%)	25 (43.1%)
No	79 (65.3%)	33 (56.9%)
Chronic fatigue:		
Yes	98 (83.1%)	43 (74.1%)
No	20 (16.9%)	15 (25.9%)
Depression:		
Yes	61 (50.8%)	25 (43.1%)
No	59 (49.2%)	33 (56.9%)
Anxiety:		
Yes	75 (62.0%)	29 (49.2%)
No	46 (38.0%)	30 (50.8%)
Chronic pain:		
Yes	89 (73.6%)	45 (76.3%)
No	32 (26.4%)	14 (23.7%)
Everyday memory problems	30.2 (14.3)	31.3 (12.7)
Workplace relationships**	18.7 (3.7)	16.4 (5.2)
Relationship with family and friends**	8.8 (2.0)	8.2 (2.3)
Fear-avoidance physical activity	8.4 (6.3)	7.3 (5.6)
Fear-avoidance work	18.8 (9.3)	21.1 (10.9)

Notes: Categorical characteristics are reported as frequency (%) and ordinal characteristics as mean (standard deviation). All rows may not add up to 181 because of missing data. \*The reason for participants reporting WAB < 1 year is likely because they have been back at work less than 26 weeks from the last period of sick leave or because they have had a combination of paid work and WAB in the past year. \*\*A higher score on the PAI scales indicate a better relationship.

confidence intervals (CI). Using the regression models we created estimated population prevalence and means for all outcomes, which were displayed with 95% confidence intervals (CI). All analyses were performed in STATA version 12 (StataCorp, Texas, USA).

## Results

The participants with duration of sick leave shorter than one year ( $n = 122$ ) were 66% women with a mean age of 42.7 years (SD 9.1 years); the 34% men had a mean age of 44.3 years (SD 10.4 years). The majority were married or living with a partner (68%) and had a high school degree (46%). The participants with duration of sick leave longer than one year ( $n = 59$ ) were 78% women with a mean age of 44.0 years (SD, 10.5 years); the 22% who were men had a mean age of 40.9 years (SD 10.3 years). The majority of participants were married or living with a partner (60%) and had a high school degree (48%).

The participants' self-reported sociodemographics and symptoms are described in Table I.

### Multivariable analyses

For multivariable analyses of sick leave duration and outcomes we included age, gender, marital status, education, and BMI as covariates. After adjusting for covariates we used the odds ratios and coefficients from logistic and linear regression to calculate estimated population prevalence and estimated population means.

The estimated prevalence of a caseness of *fatigue*, *depression*, or *anxiety* for a population on sick leave > 1 year was 79% 95% CI (67, 90), 41% 95% CI (28, 55), and 50% 95% CI (36, 64) respectively. For a population on sick leave < 1 year, the prevalence was 85% 95% CI (78, 91), 53% 95% CI (43, 62), 63% 95% CI (54, 72). The prevalence of caseness of *sleep problems* was 43% 95% CI (29, 56) in a population on sick leave > 1 year and 35% 95% CI (26, 44) in a population on sick leave < 1 year.

Looking at the two groups together, the prevalence of *fatigue*, *depression*, or *anxiety* was 9%, 12%, and 13% lower than in a population on sick leave (1 year). The prevalence of *sleep problems* was 8% higher in the group > 1 year, than the group reporting (1 year). These differences are illustrated in Table II.

Evaluating the *relationship with friends*, *family*, *co-workers*, and *the last workplace* using scales where positive scores indicated positive relationships, a population with > 1 year of sick leave had an estimated mean of 8.2 points 95% CI (7.6, 8.7) and 16 points 95% CI (15, 18) respectively. A population with < 1 year of sick leave had an estimated mean of 8.8 points 95% CI (8.4, 9.1) and 19 points 95% CI (18, 21).

Table II. Estimated population probabilities of fatigue, depression, sleep problems, or anxiety according to sick leave duration (&gt; or &lt; 1 year) from 181 patients on long-term sick leave.

Population probabilities	On over > 1 year	95% CI	Duration under < 1 year	95% CI
Pain (0–100%)	47%	[41, 53]	43%	[42, 50]
Depression (0–100%)	41%	[28, 55]	53%	[43, 62]
Anxiety (0–100%)	49%	[35, 63]	64%	[54, 73]
Fatigue (0–100%)	79%	[79, 92]	86%	[68, 91]
Sleep problems (0–100%)	41%	[29, 55]	35%	[26, 44]

Notes: Percentage represents the estimated population probability of an individual on sick leave (> or < 1 year) reporting symptoms above the validated cut-off. All percentages are rounded up/down to the closest whole percentage. All other variables in the model are kept at mean values (age, sex, education, BMI, and marital status).

Using inverse scales for *fear-avoidance with regard to work* and *everyday memory problems*, the population on sick leave for more than a year had estimated means of 21 points 95% CI (19.1, 23.9) and 31.5 points 95% CI (27, 35.9). The population on sick leave for less than one year had estimated means of 18.7 points 95% CI (16.8, 20.5) and 30.4 points 95% CI (27.6, 33.3).

Viewing the two groups together, the group on sick leave > 1 year scored 0.5 and 2.8 points lower than the group (1 year, when evaluating the *relationship with friends, family, co-workers, and the last workplace*. Those with > 1 year sick leave also displayed a higher mean in their *fear-avoidance with regard to work* and *everyday memory problems*, with the difference in averages being 2.3 points and 1.1 points respectively. See Table III for an illustration.

## Discussion

Investigating patients referred to occupational rehabilitation showed that s

ymptom profiles differed with self-reported duration of sick leave. Contrary to the stated hypothesis, the estimates for those with a longer duration of sick leave indicated a lower prevalence of fatigue, anxiety, and/or depression, while pain intensity was virtually identical. In this population however, the results indicated a worse relationship with friends, family, co-workers, and the workplace. Although there were only minor differences, there was also a trend that the participants on sick leave for more than one year reported more social problems, while psychological and somatic symptoms were less pronounced.

This pattern was reinforced by the results from FABQ, which consists of two subscales. These subscales presented less fear-avoidance to physical activity and more fear-avoidance to work in the group on sick leave longer than a year, which only adds to the aforementioned trend. Moreover, the results indicated more sleep problems in the group with a longer duration of sick leave.

The current results showed a lowered prevalence for selected somatic and psychological symptoms in

Table III. Population means estimated from 181 patients on long-term sick leave attending occupational rehabilitation.

Population means (range)	Duration over 1 year	95% CI	Duration under 1 year	95% CI
Work relationships* (0–29)	16.1	[14.9, 17.3]	18.9	[18.1, 19.6]
Relationship with family and friends* (4–24)	8.2	[7.6, 8.7]	8.8	[8.4, 9.2]
Fear and avoidance PA (0–30)	7.2	[5.6, 8.9]	8.6	[7.4, 9.7]
Fear and avoidance work (0–66)	20.9	[18.0, 23.8]	18.7	[16.9, 20.5]
Catastrophizing rhoughts (0–52)	13.7	[10.9, 16.5]	15.6	[13.7, 17.5]
Physical function* (0–100)	73.7	[70.1, 77.3]	73.5	[68.2, 78.7]
Everyday memory (0–52)	31.4	[26.9, 35.9]	30.5	[27.5, 33.4]

Notes: The means represent the estimated score of an individual on sick leave within the population with a duration over or under one year. \*For the PAI scales work relationships/relationship with family and friends, and physical function, a higher score indicates a more positive relationship. All other variables in the model are kept at mean values (age, sex, education, BMI, and marital status).

the group over one year, which is contrary to the stated hypothesis. A prospective study done in Norway has showed that the level of symptom intensity increases towards the point of being awarded disability pension (37). However, the population in that study was selected retrospectively, excluding all those who returned to work, perhaps skewing the results. This study is cross-sectional in nature, so there is no way of knowing whether the patients in this study will follow the same progression. Still, it could be expected that the population probability for symptom load of those with a longer duration of sick leave would be more adverse, not less.

Studies on patient populations have shown the course of both fatigue (38) and anxiety (39) to be insidious without targeted treatment. The exception is depression, where a natural course yields significant symptom reduction within six months (40). With regard to pain intensity, the results show that those with longer duration have slightly more or equal pain intensity than the group with shorter duration. This is in line with a large Norwegian cohort study that found pain to be stable over time, despite the complex nature of pain as a symptom (31).

In the current sample, prevalence of sleep problems is higher in the population with a longer duration of sick leave. This is in line with more recent Finnish and Norwegian prospective cohort studies showing an increased risk for all-cause disability when reporting sleep problems (41,42). In combination with earlier studies, the results indicate the importance of sufficient sleep in health perception, sick leave, and disability. However, it is important to note that both short and long sleep duration have been associated with increased risk for disability (41), so any intervention on sufficiency needs to focus on adequate duration, not necessarily more sleep.

The estimated means for relationships with co-workers and the workplace indicate that the relationships are worse in the group with longer sick leave duration. A bad relationship with co-workers and the former workplace was perhaps expected, given an earlier study arguing the exacerbation of work relationships when an employee is on sick leave (43). The results indicate that those who have not returned to work at the one-year mark might have more problems with work relationships. It is not possible to say from the current results whether this is due to a worsening of relations over time or a relationship problem existing from the start of sick leave.

The relationship with friends and family was also worse in the population with a longer duration of sick leave. A previous study reported that most people have their friends primarily at work and are dependent on that social context, which could explain

this difference (44). Another possible hypothesis is that the exacerbation of socio-economic status and lack of network would affect their home life, making it harder to maintain a positive relationship with their family. Whatever the mechanisms, the results address an important difference in groups based on duration of sick leave, warranting prospective studies that investigate causal mechanisms and directionality.

### *Limitations*

This study was intended to generate hypotheses for further investigation, and it has several limitations. The study population is a small ( $n = 181$ ), selected sample, which limits the generalizability of the findings and weakens the precision of the current estimates. While the patients are a highly selected group that has been referred to rehabilitation, they are referred from the diagnostic categories that represent the majority of long-term sick leave in Norway.

This study is cross-sectional in nature, and it is not possible to infer any causal links or directionality between the variables studied. Still, the current probabilities and means are of interest. The population is consecutively recruited and a selection bias can therefore not be excluded. But, with an inclusion rate close to 80%, the data collected have a small likelihood of being subject to any major bias.

The participants in this study were mainly white females with a high-school degree, and were referred to the outpatient clinic by a physician. They are not representative of all Norwegian workers on sick leave. The high percentage of women makes them more likely to report pain (45), fatigue (23), depression (46), and anxiety (25) than males. However, women are consistently found to be more prone to long-term sick leave, and the high percentage of women in this study reflects this fact (47).

Further, the study relied on self-report data, which are subject to social desirability and recollection errors. As an example, the participants were referred to a treatment, which might have influenced their view on, and reporting of, their symptoms.

### *Implications for future studies*

In this study, self-reported somatic and psychological symptoms appeared to be less adverse in the population who had been on sick leave longer than one year. At a group level, one could argue that social factors and sleep adequacy are more salient when the patient has been away from work for more than a year. The high prevalence and co-occurrence of symptoms in the current population underlines the need to have a

multidisciplinary approach to the rehabilitation of these patients.

Patients with a longer duration of sick leave report more relational and sleep problems. This could be related to being away from work longer, one's economy being strained, having fewer daily routines, more worries, and more rumination regarding both the past and the future. However, it could also be that these are patients with a higher risk for longer duration of sick leave because their sleep problems and relational concerns are not addressed from day one of their absence. A recent study on Swedish workers showed that employees with a history of sick leave report significantly more sleep problems than employees without previous absence (48). Speculating from these results one could argue that sleep problems seem to evolve with both duration and incidence of sick leave, either as an independent factor, a by-product, or a maintaining factor. In addition, such problems appear to have a reciprocal relationship with depression, fatigue, and musculoskeletal pain (42). In conclusion, these associations are so frequent and complex that sleep problems need to be addressed specifically in occupational rehabilitation programmes.

The continued study of patients on long-term sick leave might be important in understanding what causes the individual to remain on benefits, especially when the negative consequences are well known. The cost and impact of long-term sick leave continue to burden Western societies and it could be argued that duration is an acceptable way to create sub-groups, which could be the basis for tailoring differentiated treatments.

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