

Original Article

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The distribution of diagnoses in a population of individuals on long-term sick leave

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ABSTRACT

INTRODUCTION: The aim of this study was to investigate the distribution of International Classification of Primary Care, second edition, (ICPC-2) diagnoses in a population of individuals on long-term sick leave. Furthermore, we wanted to test if the number of diagnoses varied between assessors.

METHODS: The study population was comprised of people on sick leave aged 18-65 years attending rehabilitation appointments in Region Zealand in the period from 1 March to 31 August 2018. Five general practitioners assigned between one and three ICPC-2 diagnoses per subject. It was investigated whether there was independence between the doctors collecting the data.

RESULTS: A total of 29 diagnostic categories were established, and the three most common conditions were back pain (9.8%), musculoskeletal disorders (8.6%) and depression (7.5%). During the data collection period, a primary ICPC-2 diagnosis was made in 743 subjects, a secondary diagnosis in 371 subjects (49.9%) and a tertiary diagnosis in 101 subjects (13.6%). No significant differences were found between the number of ICPC-2 diagnoses made by the five doctors ($p = 0.49$).

CONCLUSIONS: The most common diagnoses were back conditions, musculoskeletal disorders and depression, and half of the study population had at least two diagnoses. The study shows that health professionals can assign ICPC-2 diagnoses for individuals on sick leave during rehabilitation sessions. This will give the municipalities the necessary knowledge to systematically track the development of diagnoses in order to plan individualised interventions.

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Long-term sick leave is a major socio-economic problem [1] and is associated with a decreased likelihood of returning to the labour market [2]. In Denmark, the sickness absence rate is 4.7% among women and 2.7% among men [3]. Over the course of one year, 6% of wage earners have a sick-leave period exceeding 30 days, accounting for 39% of the combined total of sick leave.

Denmark is comprised by 98 municipalities, which are primarily responsible for the rehabilitation of people, including those on long-term sick leave. Rehabilitation may be defined as a series of initiatives to support individuals who are at risk of or are currently experiencing activity limitation in attaining or maintaining the best possible level of functioning [4]. The intention is for the rehabilitation process to consist of a co-ordinated and knowledge-based effort that aims to ensure that the individual may live an independent and meaningful life. To fulfil this individual approach to rehabilitation, it is necessary to know the individual's diagnoses. Currently, diagnoses are not recorded systematically by the Danish municipalities. A more detailed and precise knowledge

on diagnoses would provide enhanced opportunities for the municipalities to tailor rehabilitation services to individual citizens.

On 1 January 2013, a legal reform came into effect regarding flexible employment, disability retirement and use of resources [5]. The aim of the reform was to increase connection to the labour market in individuals with complex problems while reducing the number of young people who are granted disability retirement pension. As part of this reform, rehabilitation teams were organised which consisted of representatives from various municipal departments (employment, health and social services) and a healthcare professional from the regional health authority. The aim of these multidisciplinary rehabilitation teams is to ensure that a tailored rehabilitation plan is prepared for all citizens with complex problems based on the individual citizen's functional ability.

Being on sick leave and returning to the labour market are complex, multifactorial processes that are not only influenced by health but also by a number of bio-psycho-social factors. Several studies have reported that diagnoses are an important factor in the planning of the rehabilitation process [6-8]. Despite this, there is rarely any differentiation within municipalities in the services offered to the individual citizen in relation to their diagnosis and other bio-psycho-social factors. It is up to each individual municipality to decide which rehabilitative services they want to offer. This means that even in a small country like Denmark, there is a risk of sizeable geographic inequality in relation to the help offered when a sick individual is to return to the labour market.

The diagnosis or classification of a condition may be thought of as a construct that gives us information about the prognosis or the expected outcome of treatment and which enables a common language between professionals with different backgrounds [9]. In the present study, we used the second version of the International Classification of Primary Care, second edition (ICPC-2) to diagnose individuals on sick leave. Different methods are available to classify disease patterns in Denmark [10]. The International Classification of Diseases, tenth version, (ICD-10) [11] is used in Danish hospitals. However, within the field of primary care, the ICD-10 can be considered too detailed, which is why ICPC diagnoses have been specifically developed for use in this area.

The aim of this study was to investigate the distribution of ICPC-2 diagnoses in a population of individuals on long-term sick leave with complex problems who are at risk of long-term marginalisation from the labour market if a multidisciplinary and coordinated rehabilitation plan is not created and put into effect. Furthermore, we wanted to test if the number of diagnoses varied between the assessors.

METHODS

The study population was individuals on sick leave aged 18-65 years who had had their situation evaluated by a multidisciplinary rehabilitation team in one of the 15 municipalities of Region Zealand comprised by the study, including: Roskilde, Sorø, Faxe, Vordingborg, Stevns, Holbæk, Greve, Næstved, Lolland, Guldborgsund, Lejre, Odsherred, Slagelse, Kalundborg and Solrød. Data were collected during the period from 1 March to 31 August 2018. Five physicians from Region Zealand's Department of Social Medicine with a background as a general practitioner assigned ICPC-2 diagnoses to sick individuals at rehabilitation meetings in Region Zealand. The five doctors were chosen based on their experience in the use of ICPC-2 from their previous work in primary care. Diagnosis guidelines were set out in detail prior to data collection. Problems and approaches were discussed and the various methods to be used to record data were tested during one month by the participating doctors. Based on the experience gained, a manual was prepared with six key instructions: 1) A maximum of three ICPC diagnoses per person, 2) Record the most significant diagnosis causing sick leave as the first ICPC diagnosis, 3) Code the current conditions, not previous illness, 4) Use organ-specific code as much as possible, 5) Use Danish

Quality Unit of General Practice's online coding tools [12] and 6) Do not code Z diagnoses (for example, Z05, problem at work). In addition to these six instructions, a registration form was developed which the municipality which the doctor could use to record information about each participant. Information about participants included Danish social security number (CPR), ICPC-2 diagnoses and the type of case being assessed by the rehabilitation team.

During the initial work on the development of the manual with its six instructions for use in diagnosis, broad agreement within the research group was reached that the ICPC-2 was the right diagnostic system to use in this study. In order to investigate whether the six instructions resulted in a significant variation in the number of diagnoses between the five assessors, the number of secondary and tertiary diagnoses assigned by each doctor was established and a chi-squared test was performed. The chi-squared test was chosen as it was considered that each of the 743 individuals in the study population was independent of each other.

Trial registration: not relevant.

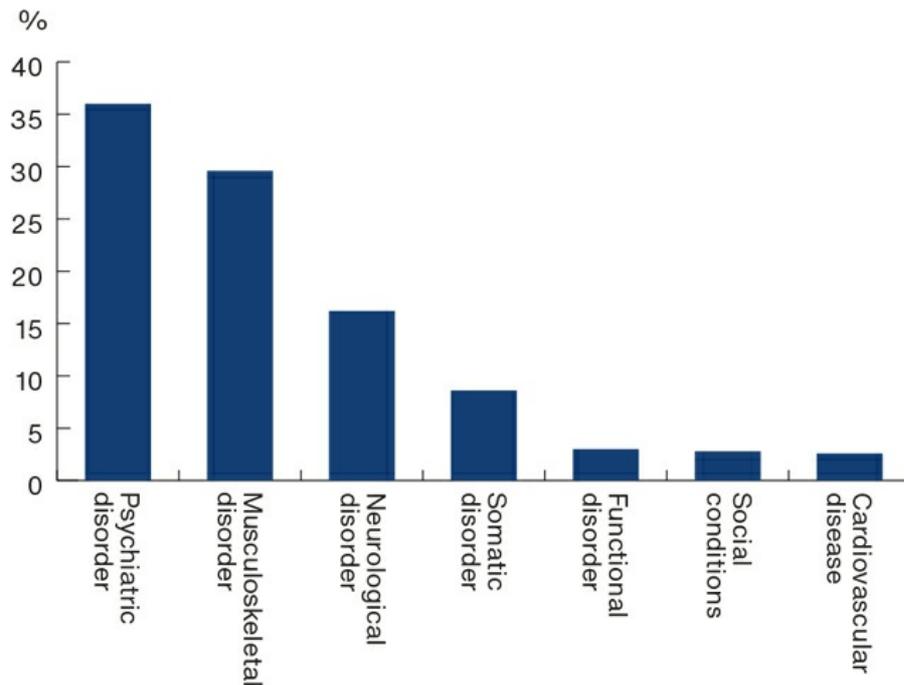
RESULTS

In the period from 1 March to 31 August 2018, a total of 743 individuals were given a primary ICPC-2 diagnosis. Among those, 371 individuals had a secondary diagnosis (49.9%) and 101 a tertiary diagnosis (13.6%). Based on the incidence of the individual ICPC-2 diagnoses, 29 overall diagnostic categories were established. The less prevalent ICPC-2 diagnoses were grouped under one of the following categories: "other psychiatric disorder", "other neurological disorder" or "other somatic disorder". Each of the 29 diagnostic categories covers one or more ICPC codes, as shown in **Table 1**. The table contains all of the 1,215 ICPC-2 diagnoses used during data collection, including all primary, secondary and tertiary diagnoses. As demonstrated, the five most common diagnoses were back conditions (9.8%), musculoskeletal disorders (8.6%), depression (7.5%), personality disorder (6.7%) and other psychiatric conditions (6.3%). Mental and physical disorders were recorded simultaneously in 11.9% of the individuals. **Figure 1** presents the distribution of all ICPC-2 diagnoses after the 29 diagnostic categories were combined into seven overall categories. **Figure 2** shows the 29 diagnostic categories and the internal distribution of primary, secondary and tertiary ICPC-2 diagnoses. The participating assessors assigned a secondary ICPC-2 diagnosis in approximately 50% of the cases and both a secondary and tertiary ICPC-2 diagnosis in 10-15% of the cases. The hypothesis of independence yielded a p-value of 0.49. Thus, there was no significant difference between the number of diagnoses made by the participating assessors.

TABLE 1 The total number of individual International Classification of Primary Care (ICPC) diagnoses as well as the symptoms they cover, ranked by frequency. All diagnoses recorded at the rehabilitation meeting are shown and include first, second and third diagnoses.

Diagnostic category: ICPC-diagnoses	At diagnostic level, n			Total, n (%) (N = 1,215)
	1	2	3	
Back condition: L01-L03, L84-L86	72	37	10	119 (9.8)
Musculoskeletal disorder: L08-L09, L11-L17, L28-L29, L72-L74, L76, L81-L82, L87, L92-L93, L98-L99	55	43	6	104 (8.6)
Depression: P76	66	23	2	91 (7.5)
Personality disorder: P80	54	21	6	81 (6.7)
Other psychiatric disorder: P03-P04, P06, P09-P10, P28-P29, P71, P75, P86, P98-P99	50	22	5	77 (6.3)
Anxiety: P01, P74, P79	46	19	6	71 (5.8)
Other neurological disorder: H03, H86, N17-N19, N29, N73, N75, N81, N85-N88, N93-N94, N99, P20, P24, P70	41	21	8	70 (5.8)
Stroke: K90, N80	45	11	4	60 (4.9)
Musculoskeletal pain: A01	27	25	6	58 (4.8)
Arthritis and arthrosis: L20, L88-L91	30	12	4	46 (3.8)
Other somatic disorder: A29, A78, A81-A82, A90, A92, A99, B99, D20, D91, D97, F05, F16, F28, F94, F99, L04, S14, S29, S88-S98, T05, T82, U88, U99, X99	14	22	5	41 (3.4)
Intellectual disability: P85	29	7	0	36 (3.0)
Functional disorder: L18, P78	25	10	1	36 (3.0)
PTSD: P82	24	8	3	32 (2.6)
Whiplash syndrome: L83	23	9	0	32 (2.6)
Cardiovascular disease: K28-29, K71, K74, K76-K78, K80, K83-K84, K92-K94	16	11	4	31 (2.6)
Attention deficit disorder: P81	10	16	4	30 (2.5)
Substance abuse: P15, P19	8	14	7	29 (2.4)
Adjustment reaction: P02	24	3	1	28 (2.3)
Airway and pulmonary disease: R95, R96, R99	14	10	2	26 (2.1)
Concussion: N79	14	5	0	19 (1.6)
Endocrine disorder: T85-T86, T89-T90, T99	7	4	8	19 (1.6)
General weakness: A04	13	3	0	16 (1.3)
Bipolar affective disorder: P73	12	2	1	15 (1.2)
Schizophrenia: P72	10	2	0	12 (1.0)
Headache: N01, N89-N90, N95	3	4	5	12 (1.0)
Cancer: A79, B73, D77, N74, R85, X76-X77	8	0	2	10 (0.8)
Gastrointestinal disorder: D11, D18, D94-D95, D99	2	4	2	9 (0.7)
Social conditions: Z04, Z15-Z16, Z18, Z28	0	3	2	5 (0.4)

FIGURE 1 The percentage distribution of the incidence of a primary, secondary or tertiary International Classification of Primary Care 2 diagnoses within the seven diagnostic categories.



The seven diagnostic categories

Psychiatric disorder: depression, personality disorder, other psychiatric disorder, anxiety, PTSD, attention deficit disorder, bipolar affective disorder and schizophrenia.

Musculoskeletal disorder: back condition, musculoskeletal disorder, musculoskeletal pain, arthritis and arthrosis and whiplash syndrome.

Neurological disorder: other neurological disorder, stroke, intellectual disability, headache and concussion.

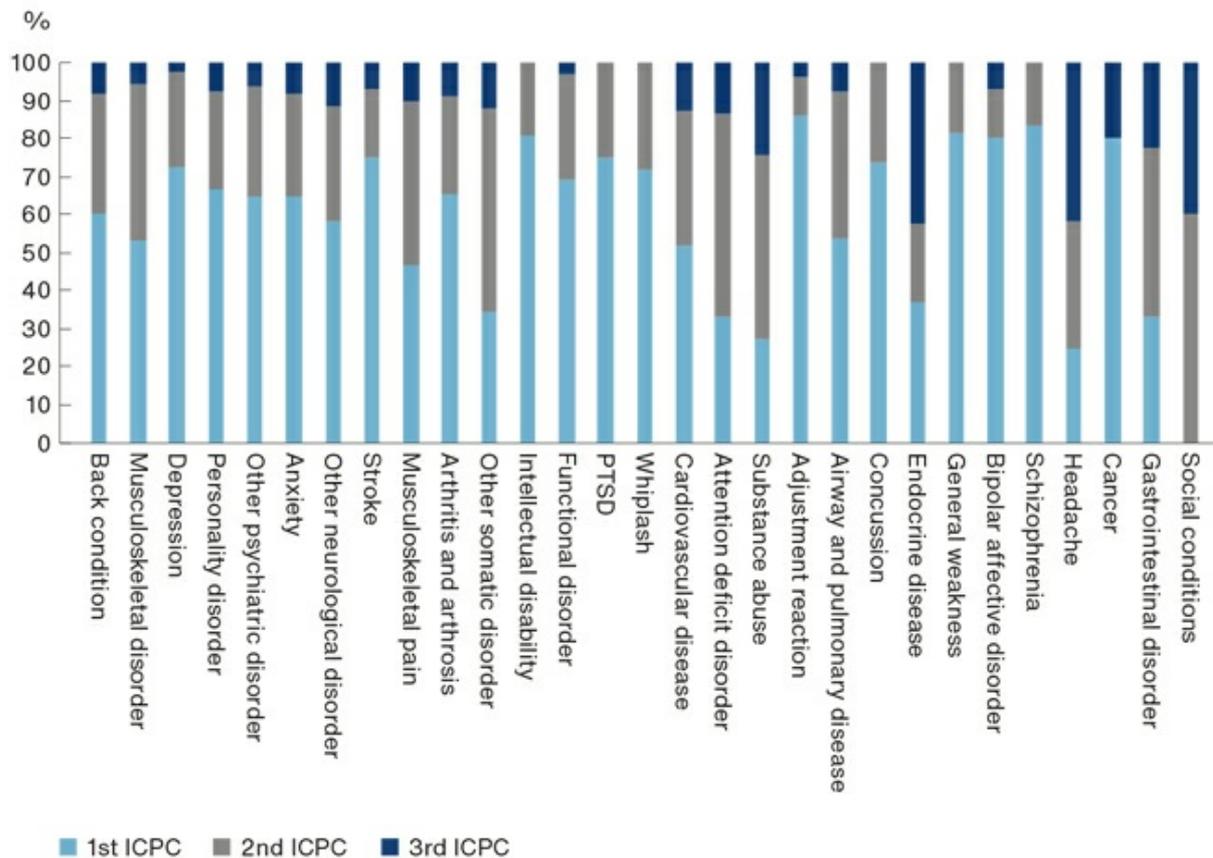
Somatic disorder: other somatic disorder, airway and pulmonary disease, general weakness, endocrine disorder and gastrointestinal disorder.

Functional disorder: fibromyalgia and neurasthenia.

Social conditions: Substance abuse and social conditions.

Cardiovascular diseases: cardiovascular disease.

FIGURE 2 The 29 diagnostic categories and the internal distribution of primary, secondary and tertiary International Classification of Primary Care (ICPC) 2 diagnoses.



DISCUSSION

Diagnostic distribution in individuals on long-term sick leave

In Denmark, data on the distribution of diagnoses among people with long-term sick leave are limited. A Danish report from 2007 investigated the incidence of mental illness in a population of individuals on long-term sick leave [13]. The study demonstrated a prevalence of mental illness of almost 50% among individuals with long-term sick leave. A Danish study from 2008 interviewed 1,739 people and found that diagnoses had a significant effect on return to the labour market and that those with musculoskeletal disorders had the poorest prognosis [7]. These diagnoses were poorly defined, however; in part because self-reports were equated with medical diagnoses and in part because the diagnoses were combined within broad categories. A return-to-work (RTW) project was conducted in Denmark between 2010 and 2012 [14]. The project gathered self-reported diagnoses from approximately 75,000 individuals on sick leave. Within the study group, which is comparable to the population of the present study, 52.1% stated that their primary diagnosis was a psychiatric disorder, whereas 47.9% attributed their sick leave to a somatic disorder.

The significance of a diagnosis as a prognostic factor was investigated in a Swedish study using the ICD-10 to determine the effect of the diagnoses on return to the labour market for 600,000 individuals [6]. The study concluded that a diagnosis is a good predictor of long-term sick leave, but that that more detailed research is

warranted. In the present study, 743 diagnoses were made by a primary care professional who had significant knowledge about the individuals from an interview with the person and from access to case notes with medical and social information. The results show that the diagnoses of back conditions and musculoskeletal disorders are the most common reasons for sick leave. By combining the different diagnostic categories shown in Figure 1, psychiatric disorders appear as the group accounting for the largest percentage of long-term sick leaves.

Individuals on long-term sick leave often have co-morbidities, and somatic and mental disorders frequently overlap. In the present study, 49.9% of the study population had at least two diagnoses, and 11.9% of the combined total had both a physical and a mental disorder. Due to increasing life expectancy and improved treatment of chronic conditions, the number of people living with multiple diagnoses is increasing [15]. Therefore, there is a growing demand for planning of individual and multidisciplinary rehabilitative approaches.

Strengths and limitations in the use of the ICPC-2 classification system

We chose to use the ICPC-2 classification system in this study because the structure of multidisciplinary rehabilitation meetings resembles a consultation in primary care and because the municipalities and departments of community medicine work closely together with general practitioners allowing information to be exchanged more easily. It was determined that the ICPC classification was the correct diagnostic system to use in this context owing to the thorough preliminary work that was conducted and the six instructions provided in the manual. This is supported by the results of the chi-squared test, which showed no significant difference in the number of secondary and tertiary diagnoses made by the five participating doctors.

Objective examination was not carried out during the multidisciplinary rehabilitation meetings. In this study, the diagnoses were based on health information and dialogue, which increases the risk of misdiagnoses. This uncertainty is present both when the ICPC-2 classification system and the ICD-10 is used, making the more dialogue-based ICPC system better suited in this context. Use of the ICPC-2 diagnostic system may raise other uncertainties. The ICPC-2 is less detailed and specific than the ICD-10 because it has fewer codes [16]. The ICPC diagnostic system was designed to describe the common problems encountered in primary care, but not the degree or the cause of a condition. Rather, the ICPC-2 was mapped to the ICD-10, whereby it is possible to specify an ICPC diagnosis. This provides additional diagnostic detail and improves the quality of communication with secondary healthcare and municipalities. Several studies on rehabilitative interventions have found the use of the diagnostic classification ICPC-2 feasible and usable to identify patient groups [13, 17-19].

In order to investigate the use of the ICPC-2 diagnoses among the five assessors, an actual study of interobserver variation would have been more accurate. However, it was unrealistic to have all five doctors diagnose each patient.

CONCLUSIONS

In the period from 1 March to 31 August 2018, a total of 743 individuals on long-term sick leave were assigned diagnoses according to the ICPC-2 system. Hereof, 371 (49.9%) were assigned secondary and 101 (13.6%) were assigned tertiary ICPC-2 diagnoses. The most common diagnoses among individuals on long-term sick leave were back conditions, musculoskeletal disorders and depression. Approximately half of the individuals had a minimum of two simultaneous diagnoses. Based on this study, healthcare professionals can assign ICPC-2 diagnoses to individuals on sick leave during rehabilitation meetings. If systematic recording is introduced, the Danish municipalities may possibly track the development of diagnoses in their sick leave population, and use the information collected to prepare organised and targeted rehabilitation plans.

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