# Prevalence of psychiatric disorders in sick listed chronic low back pain patients

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**ABSTRACT**

**Background:** Previous findings have shown a high degree of comorbid psychopathology in chronic low back pain (CLBP), but less is known about the broad range of comorbid psychiatric disorders. The prevalence is reported to be between 40%-100% depending on methods being used, sample or setting.

**Aims:** To assess the prevalence of psychiatric comorbidity in a population of CLBP patients, using a psychiatric diagnostic interview.

**Methods:** 565 patients sick listed between 2 and 10 months for unspecific LBP were included in the study. All were recruited as part of an ongoing trial in secondary care, and were assessed with the Mini-International Neuropsychiatric Interview (MINI), which is a short structured diagnostic interview for DSM-IV and ICD-10 psychiatric disorders.

**Results:** The prevalence of current psychiatric disorders was 31%. The diagnoses included 19 Axis I disorders, with the most common being somatoform disorders (18%) and anxiety disorders (12%). Major depressive disorders were reported in 4%. There were no gender differences in prevalence of psychiatric disorders.

**Conclusions:** In a large population of CLBP patients, 31% fulfilled the criteria for at least one current psychiatric disorder when measured with a diagnostic interview. The diagnoses included a wide range of psychiatric disorders, with the most common being somatoform disorders (18%) and anxiety disorders (12%). The results imply that screening CLBP patients for psychiatric comorbidity in secondary care is important since psychopathology may have serious consequences for prognosis, outcome and health care utilization.

## INTRODUCTION

Low back pain (LBP) is a common condition that affects large parts of the population, with up to 40% of the general population reporting LBP during last month (Ihlebaek et al., 2002). Although experienced by the majority, the complaints endure and disable in a minority. Chronic LBP (CLBP) is a condition where biological, psychological and social factors interact and mutually influence each other, both as causal factors and in maintaining the complaints (Dersh et al., 2001; Waddell, 2004a). In CLBP there is a high degree of comorbidity with reports of additional somatic and psychological symptoms and complaints (Carnes et al., 2007; Hagen et al., 2006; Von Korff et al., 2005). Prevalence of comorbid psychiatric disorders is often assessed and considered. In most cases questionnaires, and not diagnostic interviews, are conducted (e.g. Currie and Wang, 2004; Manchikanti et al., 2002; Mok and Lee, 2008).

Studies where diagnostic interviews have been used to assess psychiatric comorbidity in CLBP, show consistently high prevalence varying from 41% to 99% (Atkinson et al., 1991; Dersh et al., 2006; Kinney et al., 1993; Polatin et al., 1993; Reich et al., 1983). The most common disorders are somatoform disorders, affective disorders and substance abuse disorders, with major depression as the most common single diagnosis (Kinney et al., 1993; Polatin et al., 1993). Psychiatric disorders are also significantly more prevalent in those reporting CLBP compared to those without CLBP in the general population, as seen across 17 countries in the world mental health surveys (Demyttenaere et al., 2007).

The fewer structural and neurological deficits found by somatic examinations in CLBP patients, the more psychiatric symptoms are present (Mayr et al., 2003). The same findings were reported more than 30 years ago in the well known study by Magni and Merskey (1987), when patients with pain caused by organic lesions such as disc herniation or radicular deficits showed lower prevalence of psychological problems than patients with pain where no organic causes were identified (Magni and Merskey, 1987). Number of pain complaints has been found to increase the likelihood of psychopathology (Katon and Sullivan, 1990), and more widespread pain has been associated with disability (Kamaleri et al., 2008). The association between pain and psychopathology are further strengthened as severity of either condition increases (Carroll et al., 2000). Concurrent psychopathology in CLBP imply poor prognosis (Linton, 2000), poor outcome (Dersh et al., 2007) and high health care utilization (Engel et al., 1996), and clinical guidelines emphasize the importance of screening for psychopathology in these patients (Airaksinen et al., 2006).

A wide range of different questionnaires have been used to assess psychopathology in CLBP patients by self-report, but structured clinical interviews like SCID (First et al., 1997) or MINI (Sheehan et al., 1998) are the gold standard for diagnosing psychopathology according to DSM-IV criteria, which is the main diagnostic system classifying psychiatric illness. The aim of the study was therefore to assess the prevalence of psychiatric comorbidity in a population of CLBP patients through a psychiatric diagnostic interview based on DSM-IV and ICD-10 criteria.

## MATERIALS AND METHODS

*Participants*

574 patients, mean age 45 years and 50.5% women were included in the study. They were sick listed for unspecific LBP (International Classification of Primary Care (WHO, 2003): L03, L04, L84 & L86) and were between 20 and 60 years. One patient dropped out and withdrew consent, one patient was excluded after randomization due to high suicide risk, and 7 patients have all baseline data missing, leaving 565 patients. All patients were consecutive participants in an ongoing trial with different treatments for LBP. Over a period of 2 years, patients registered as sick listed (2-10 months) due to LBP received information from the National Insurance Administration about the possibility to participate in a multicenter randomized controlled trial with different treatments for LBP (clinicaltrials.gov, 2010). Those who responded to the invitation (n=2200) were screened by telephone and excluded if they did not fulfil the inclusion criteria or could not be reached (n=1563). Eligible patients (n=637) were referred to the clinic for inclusion in the trial. At the clinic, patients were excluded if one of the following were discovered during the medical examination: Pregnancy, osteoporosis (known osteoporotic fracture), cancer (currently being treated for cancer), recent back trauma, serious psychiatric disorder (mainly due to ongoing psychosis, high suicide risk, and/or serious depression), cardiovascular disease, or not fluent in Norwegian language (n=63) (see figure 1 for more detailed flowchart). Mean duration of back pain reported by the participants was 11 years (see table 1 for more baseline and clinical characteristics).

*Questionnaires*

All patients answered a number of standard validated Norwegian versions of questionnaires. Data reported in this study include demography, pain, psychological distress, and health complaints. Anxiety and depression was measured by *The Hospital Anxiety and Depression Scale (HADS)* (Zigmond and Snaith, 1983). The HADS has been found to be a reliable instrument for detecting states of depression and anxiety, and the anxiety and depressive subscales are also valid measures of severity of the emotional disorder (Bjelland et al., 2002). The scale avoids overlap with somatic symptoms of physical illness. It consists of seven depression items and seven anxiety items. Scores for each item range from 0-3 and the higher the score the more severe the disorder. A cut off score of 8 on both subscales were used because this have been found to give an optimal balance between sensitivity and specificity according to DSM-III, DSM-IV, ICD-8, and ICD-9 (Bjelland, et al., 2002). Subjective health complaints were measured by 29 items from the *Subjective Health Complaint Inventory* (Eriksen et al., 1999). Subjective somatic and psychological complaints experienced during the last 30 days were assessed, with severity scored on a 4-point scale. The prevalence on five subscales was calculated: musculoskeletal complaints, "pseudoneurological complaints" (extra heartbeats, hot flushes, sleep problems, tiredness, dizziness, anxiety, and sadness/depression), gastrointestinal complaints, allergy and flu. A revised version of the *Brief Pain Inventory (BPI)* was used to assess pain (Keller et al., 2004). Three single items from the BPI were used here. Pain intensity related to activities and rest were both measured on a scale from 1 (no pain) to 9 (worst possible pain), while back pain intensity the last 14 days was measured on a scale ranging from 1 (no pain) to 10 (worst possible pain).

*Psychiatric interview*

The Mini-International Neuropsychiatric Interview (MINI) was applied as the structured diagnostic interview (Sheehan et al., 1998) for DSM-IV (American Psychiatric Association, 1994) and ICD-10 (World Health Organization, 1993) assessing psychiatric disorders. It is a short structured diagnostic interview, developed jointly by psychiatrists and clinicians in the United States and Europe. It is based on "yes" and "no" answers and covers 23 Axis 1 disorders. In the multiaxial system of DSM-IV, Axis I disorders include all major mental disorders as well as developmental and learning disorders. The MINI interview usually takes 15-20 minutes, and has high reliability and validity (Sheehan et al., 1998). We used the Norwegian version of MINI Plus (Leiknes et al., 2005). The MINI Plus is a version of the MINI interview that is particularly designed for research. It features questions on rule-outs (e.g. depressive reaction due to grief), disorder subtyping (e.g. somatoform pain disorder related to psychological factors *or* somatic condition) and chronology (e.g. when was the first time you experienced a panic attack?), and includes modules for somatisation disorders (e.g. hypochondriasis and somatoform pain disorder). MINI Plus further employs different time frames for various disorders: current, past, or lifetime. "Current" refers to past 2 weeks (major depression), past month (panic disorder, social phobia, obsessive compulsive disorder, PTSD), past 12 months (alcohol dependency/abuse), or ongoing at the time of interview with no further time reference (mania, agoraphobia, generalized anxiety disorder, psychotic disorders, somatisation disorders, anorexia, bulimia). In this way, MINI differs from most other diagnostic interviews that usually ask for symptoms within the past 12 months.

*Procedure*

Eight medical doctors specialised in physical medicine and rehabilitation performed the MINI. They had been trained in administration of the MINI interview through a half-day seminar. The seminar was lead by an experienced psychiatrist (second author). Additionally, interviewers were supervised by a psychologist (first author) knowledgeable in MINI administration, who reviewed completed MINI's and clarified any clinical questions regarding the diagnoses. Every interview was audiotaped, and 90 audiotapes were randomly selected for evaluation by a psychologist (first author) and a psychology graduate student. A smaller selection of the audiotapes was double-scored, showing good inter-rater reliability. The evaluations showed satisfactory quality in the majority of the interviews. If the evaluation revealed that protocol was not followed, feedback was given and interviewers were supervised accordingly. However, no interviews were considered too poor not to be included in the study. If any of the responses the interviewers reported on the MINI-interview appeared unclear or ambiguous, the audiotapes were used for clarification.

*Statistical procedure*

SPSS version 15 was applied for all analyses. Descriptive statistics (e.g. frequency tables) were used when investigating baseline characteristics and prevalence of psychiatric disorders, and confidence intervals were calculated for the prevalence of all psychiatric disorders. Chi-square statistics were used to investigate potential gender differences. MINI diagnoses that were not filled out by the doctors were coded missing. However,

when the main category of a disorder was scored 0, the subcategory of this disorder was scored 0 as well. For example, if major depressive disorder was scored 0 (meaning no diagnosis) and major depressive disorder with melancholia was missing, the latter was scored 0 as well.

*Ethical considerations*

The study was approved by The Regional Ethical Committee and the Norwegian Social Science Data Services National Register of Data. All principles in the Helsinki declaration were followed. Informed consent was signed by each participant with emphasis on the right to withdraw from the study at any time without any explanation.

**RESULTS**

99% of the CLBP patients had other health complaints in addition to LBP, with a mean of 10 subjective health complaints. Mean back pain intensity was 6.4 on a scale from 1 to 10. According to HADS, 18% were possible cases of depression (score >8) and 21% possible cases of anxiety (table 1).

Insert table 1 about here

212 (38%) of the CLBP patients had at least one DSM-IV psychiatric diagnosis (current or lifetime), while 169 (31%) presented with a current diagnosis. Based on the total number of diagnoses, 117 (21%) had one diagnosis, 35 (6%) had two diagnoses, 32 (6%)

had three diagnoses, and 28 (5%) had more than 3 diagnoses. There were no differences in total prevalence of psychiatric disorders between women and men ($\chi$=2.370; $p$=0.134), but a comparison of diagnostic categories showed that men had significantly higher prevalence of substance abuse than women ($\chi$=7.755; $p$=0.006).

When the single diagnoses were grouped into diagnostic categories, somatoform disorders (18%) and current anxiety disorders (12%) were the most prevalent diagnostic categories, while current depressive disorders were seen in only 4% (table 2).

Somatoform pain disorder related to psychological factors was the single most prevalent disorder (n=53, 10%), followed by past depressive episode (n=46, 8%), somatoform pain disorder related to psychological factors and a general somatic condition (n=33, 6%), social anxiety disorder (n=30, 5%) and agoraphobia (n=26, 5%) (table 3).

**DISCUSSION AND CONCLUSIONS**

In a population of 565 chronic low back pain (CLBP) patients, 38% had at least one current or lifetime psychiatric disorder, while 31% had at least one current disorder. The most prevalent diagnoses were somatoform disorders and anxiety disorders, while major depressive disorders were seen in only 4%. There were no gender differences in prevalence of psychiatric disorders.

A comparison with the general population is difficult since most studies report 12 months prevalence as opposed to our point prevalence (M.I.N.I. usually asks for symptoms the

last 14 days or month). A total of 32.8% of the general population in Norway had a current psychiatric disorder, which is almost identical to our findings of 31.4%. Our findings showed a lower prevalence of current depression, panic disorder, social phobia and alcohol dependency, but higher prevalence of other anxiety disorders (GAD, OCD and agoraphobia), drug dependency and somatoform disorders (Kringlen et al., 2001). Similar rates were found in a review of epidemiological studies from 16 European countries, where a 12 months prevalence of 27% were reported (Wittchen and Jacobi, 2005). However, assessments of 12 months prevalences generally give higher prevalence numbers. In an epidemiological study where 1 month prevalence was measured, the prevalence rate of psychiatric disorders was only 15% (e.g. Regier et al., 1988). Furthermore, epidemiological studies from several other countries have reported lower levels of psychiatric disorders in the general population. In Netherland the prevalence of psychiatric disorders within the preceding year was 23% (Bijl et al., 1998), while results from six European countries found a 12-months prevalence of 6% anxiety disorders, 4% mood disorders, and 1% alcohol disorders (Alonso et al., 2004). Our findings therefore imply that CLBP patients present with more psychiatric disorders than the general population.

Our prevalence rates of psychiatric disorders in CLBP are lower than previous findings, especially for depression (Dersh et al., 2006; Kinney et al., 1993; Polatin et al., 1993; Reich et al., 1983). This could be a result of selection bias, i.e. fewer patients with psychiatric disorders choosing to participate in the study. It could also be related to an underreporting of psychological symptoms resulting in a negative response bias. The

possible underreporting may be related to a biomechanical understanding among the patients, social stigma related to mental disorders, or the administrators who were medical doctors not specialised in psychiatry. Previous studies have found good agreement between MINI diagnoses generated by general practitioners and expert psychiatrists (Sheehan et al., 1998), but we cannot rule out the possible influence of a negative response bias. Other reasons for the lower prevalence in our results could be related to a lower educational level of participants in some previous studies (Dersh et al., 2006; Kinney et al., 1993; Reich et al., 1983) and more female participants in others (Reich et al., 1983), both known risk factors for psychiatric disorders. Our results were for instance more in line with a study where all participants were men (Atkinson et al., 1991). A gender difference was on the contrary found for only one disorder (substance abuse) in our study and thus weakens gender as an explaining variable. The health care system and the compensational systems in North-America and Norway differ widely and therefore complicate a direct comparison of the studies. Different settings in which the psychiatric interviews were performed might also contribute to the different results, as previously proposed by Merskey et al (1987). Our study was conducted in secondary care, primarily in spine clinics. This is quite different to some of the comparative studies; one in a tertiary setting where the patients had experienced unsuccessful treatments in both primary and secondary care (Dersh et al., 2006), and another in a chronic pain clinic where the patients had undergone multiple unsuccessful treatment approaches (Reich et al., 1983). Considering that previous findings have demonstrated that psychopathology is a strong predictor of poor treatment outcome (Dersh et al., 2007; Hasenbring, 1998; McCracken and Turk, 2002), patients with a history of multiple unsuccessful treatments

would be expected to present with more psychiatric comorbidity. Repeated experiences of failed treatments could further result in a feeling of helplessness and hopelessness for the individual, where all attempts of help leads to no change or maybe even worse outcomes (Ursin and Eriksen, 2004). These experiences will most likely trap the individual in a vicious circle of pain, disability, low coping and an increasing level of comorbidity, including psychiatric disorders.

Compared with the results from the world mental health surveys (Demyttenaere et al., 2007), our results appear less deviant. In fact, our prevalences of psychiatric disorders are all within the range of those found in people who reported chronic back or neck pain across the different countries (Demyttenaere et al., 2007). Our results are in the lower range of estimates for depression and upper range for anxiety disorders and alcohol abuse disorder. Prevalence estimates from the US were consistently higher than the rest of the world in the world mental surveys (Demyttenaere et al., 2007). This supports the previously presented hypothesis of cultural differences or differences in health care systems.

Chronic back pain patients are by some regarded to be somatising patients who express psychological and social distress through persistent subjective health complaints (Ford, 1983). This is reflected in the extremely high prevalence of somatoform pain disorders often found in chronic back pain populations, with 99% diagnosed by some (Kinney et al., 1993). It may be argued that a high prevalence of somatoform pain disorder is universally descriptive of the population and therefore not necessary to report (Dersh et

al., 2006). However, in our results only 16% of the CLBP patients were diagnosed with a somatoform pain disorder. Whether this was due to more strict diagnostic criteria, underreporting, or other characteristics of the population is hard to say, but it is an interesting finding that challenges the notion that the majority of CLBP patients suffer from somatoform pain disorder. The first question of the somatoform pain disorder module is: "is pain currently your main problem?", and the fact that more than one third of the participants, all sick listed for pain in their lower back, answered no to this question, is interesting. The most intuitive explanation of this might simply be that other complaints or problems besides pain are the main concern of a large proportion of the group. The CLBP patients present with a high number of subjective health complaints and psychiatric disorders which could be one explanation. Alternatively other problems like marital, financial, or work-related problems could be their greatest concern, and could all be part of the vicious circle of chronicity (Hagen, 2006). One way to follow up on this could be to ask the participants to rate their main concerns on a list where all kinds of problems were included.

The magnitude of undetected psychiatric illness in primary care is widely recognized (Christensen et al., 2003; Goldberg and Bridges, 1987; Paykel and Freeling, 1992) and involves consequences such as undertreatment (Overland et al., 2007) and increased costs due to disability pensions (Mykletun et al., 2006). Screening for psychiatric disorders in secondary care therefore appears vital since psychiatric comorbidity in CLBP may have serious consequences for prognosis (Linton, 2000), outcome (Dersh et al., 2007) and health care utilization (Engel et al., 1996).

In conclusion, 31% of a large population of CLBP patients fulfilled the criteria for at least one current psychiatric disorder when measured with a diagnostic interview. The diagnoses included a wide range of psychiatric disorders, with the most common being somatoform disorders (18%) and anxiety disorders (12%). The results imply that screening CLBP patients for psychiatric comorbidity in secondary care is important since psychopathology may have serious consequences for prognosis, outcome and health care utilization.

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## TABLES

**Table 1.** Baseline and clinical characteristics (n=565)

| Continuous variables | Mean | SD | Median |
|---|---|---|---|
| Age | 45 years | 9.8 | 45 |
| Duration of back pain | 11 years | 10.6 | 7.5 |
| Back pain intensity (1-10) | 6.5 | 1.9 | 7.0 |
| Pain during activity (1-10) | 5.9 | 2.2 | 6.0 |
| Pain while resting (1-10) | 4.0 | 2.2 | 4.0 |
| Subjective health complaints, number of complaints | 10.0 | 4.9 | 10.0 |

| Categorical variables | n | % |
|---|---|---|
| Gender | | |
| Men | 273 | 49.5 |
| Women | 279 | 50.5 |
| Civil status | | |
| Married/cohabitant | 396 | 71.7 |
| Single/widow/divorced | 156 | 28.2 |
| Education | | |
| Primary school 1-12 years | 344 | 62.5 |
| University/college | 164 | 29.8 |
| Other | 42 | 7.6 |
| HAD | | |
| Depression (score >8) | 95 | 17.5 |
| Anxiety (score >8) | 115 | 21.0 |
| Is pain currently your main problem? | | |
| Yes | 375 | 67.6 |
| No | 177 | 31.9 |
| Subjective health complaints | | |
| Musculoskeletal complaints | 528 | 99.2 |
| Pseudoneurological complaints | 477 | 89.7 |
| Gastrointestinal complaints | 360 | 67.5 |
| Allergy | 243 | 45.6 |
| Flu | 228 | 42.9 |

**Table 2.** Summary of the main diagnostic categories from the MINI diagnostic interview (n=565)

| Main diagnostic categories | n | % | (95% CI) |
|---|---|---|---|
| Any somatoform disorders, current | 97 | 17.9 | (14.6-21.1) |
| Any depressive disorders, current | 20 | 3.6 | (2.1-5.2) |
| Any depressive disorders, past | 54 | 9.8 | (7.3-12.2) |
| Any anxiety disorders, current | 69 | 12.4 | (9.7-15.2) |
| Any anxiety disorders, past | 42 | 7.6 | (5.4-9.9) |
| Any substance disorder (lifetime and current) | 21 | 3.8 | (2.2-5.4) |

**Table 3.** Prevalence of single diagnoses from the MINI diagnostic interview (the total is more than 38% because of the presence of comorbidities) (n=565)

| **Axis 1 Disorder** | **n** | **%** | **(95% CI)** |
|---|---|---|---|
| **MINI positive** (any DSM-IV Axis I diagnosis) | **212** | **38.2** | **(34.2-42.2)** |
| Any current disorder | 169 | 31.4 | (27.5-35.3) |
| Somatoform disorders | | | |
| Hypochondrias | 18 | 3.2 | (1.8-4.7) |
| Somatoform pain disorder related to psychological factors | 53 | 9.6 | (7.2-12.1) |
| Somatoform pain disorder related to psychological factors and a general somatic condition | 33 | 6.0 | (4.0-8.0) |
| Somatisation disorder, lifetime | 6 | 1.1 | (0.2-2.0) |
| Somatisation disorder, present | 6 | 1.1 | (0.2-2.0) |
| Anxiety disorders | | | |
| Generalized anxiety disorder (GAD), current | 23 | 4.1 | (2.5-5.8) |
| Panic disorder, lifetime | 25 | 4.5 | (2.8-6.2) |
| Panic disorder, current | 7 | 1.3 | (0.3-2.2) |
| Agoraphobia, lifetime | 26 | 4.7 | (3.0-6.5) |
| Agoraphobia, current | 21 | 3.8 | (2.2-5.4) |
| Social anxiety disorder, current | 30 | 5.4 | (3.5-7.3) |
| Obsessive-compulsive disorder (OCD), current | 6 | 1.1 | (0.2-1.9) |
| Post traumatic stress disorder (PTSD), current | 3 | 0.6 | (-0.1-1.2) |
| Substance use disorders | | | |
| Alcohol abuse/dependence, current | 12 | 2.2 | (1.0-3.4) |
| Alcohol abuse/dependence, lifetime | 12 | 2.2 | (1.0-3.4) |
| Drug abuse/dependence, current or lifetime | 6 | 1.1 | (0.2-1.9) |
| Eating disorders | | | |
| Anorexia nervosa | 0 | 0 | |
| Bulimia nervosa | 3 | 0.5 | (-0.1-1.2) |
| Affective disorders | | | |
| Major depressive episode, current | 17 | 3.1 | (1.6-4.5) |
| Major depressive episode, past | 46 | 8.3 | (6.0-10.6) |
| Major depressive episode with melancholia, current | 7 | 1.3 | (0.3-2.2) |
| Major depressive episode with melancholia, past | 9 | 1.6 | (0.6-2.7) |
| Dysthymia, current | 3 | 0.5 | (-0.1-1.2) |
| Dysthymia, past | 2 | 0.4 | (-0.1-0.9) |
| Manic episode, current | 0 | 0 | |
| Manic episode, past | 6 | 1.1 | (0.2-1.9) |
| Suicide – minor to moderate risk | 35 | 6.5 | (4.4-8.6) |
| Psychotic disorder, current or lifetime | 2 | 0.4 | (-0.1-0.9) |