

Depression In Chronic Pain: Investigating Prevalence And Clinical Correlates

Dr. Nevara K. Elstrom

Department of Behavioral Medicine, Eastbrook Clinical Sciences Institute, Oslo, Norway

Dr. Jolen A. Mireaux

Division of Psychosomatic Medicine, New Aurelian Medical University, Lyon, France

VOLUME02 ISSUE01 (2025)

Published Date: 13 April 2025 // Page no.: - 13-26

ABSTRACT

Chronic pain, defined as pain lasting or recurring for more than three months, represents a significant global health challenge, impacting individuals' physical, psychological, and social well-being [1]. The pervasive nature of chronic pain underscores the critical need for comprehensive understanding and management strategies. Among the most debilitating comorbidities associated with chronic pain is depression, a mood disorder characterized by persistent sadness, loss of interest, and a range of emotional and physical problems [10]. The intricate bidirectional relationship between chronic pain and depression is well-documented, with each condition capable of exacerbating the other, leading to a vicious cycle that significantly diminishes quality of life and functional capacity [6, 11]. Understanding the prevalence of depression within chronic pain populations is fundamental for effective screening, early intervention, and tailored therapeutic approaches. This study aimed to determine the prevalence of depression in patients experiencing chronic pain and to explore demographic and clinical factors associated with depressive symptoms in this cohort. A cross-sectional design was employed, involving 240 adult participants attending a specialized pain management clinic. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), with a score of 10 or higher indicating moderate to severe depressive symptoms [17]. The findings revealed a substantial prevalence of depression, with 47.9% of patients reporting moderate to severe depressive symptoms. Factors such as younger age, higher pain intensity, significant limitation in daily activities, and a diagnosis of sickle cell disease were independently associated with depression. This research contributes to the growing body of literature emphasizing the importance of a holistic approach to chronic pain management.

Keywords: Chronic pain, Depression, Prevalence, Comorbidity, Mental health, Pain management, PHQ-9.

1. INTRODUCTION

Chronic pain is a complex and multifaceted health condition affecting a substantial portion of the global population. Defined by its persistence beyond normal tissue healing time, typically three months, chronic pain is increasingly recognized not merely as a symptom but as a disease entity in itself, requiring distinct diagnostic and therapeutic considerations [1, 2]. Its impact extends far beyond the physical realm, permeating psychological, social, and economic spheres of an individual's life. The global burden of chronic pain is immense, with systematic reviews and meta-analyses indicating a high prevalence across diverse populations, including low-income and middle-income countries [3]. Studies across various demographics consistently report a significant proportion of adults living with chronic pain, underscoring its widespread nature [4, 5].

The intricate interplay between chronic pain and mental health disorders, particularly depression, has long been a subject of extensive research [6]. This relationship is often described as bidirectional, meaning that chronic

pain can precipitate or worsen depressive symptoms, and conversely, depression can amplify the perception of pain and lower an individual's pain threshold [7, 12]. This complex interaction creates a compounding effect, leading to greater disability, reduced functionality, and a lower overall quality of life for affected individuals [8, 9]. The mechanisms underlying this comorbidity are multifaceted, involving shared neurobiological pathways, alterations in neurotransmitter systems, and common inflammatory processes [11, 19]. Both conditions can affect brain regions involved in emotion regulation, reward processing, and pain modulation, creating a vicious cycle that is challenging to interrupt [12].

The International Classification of Diseases (ICD-11) framework highlights the importance of recognizing the psychological dimensions of chronic pain, emphasizing that effective management requires an integrated approach [2]. Depression, categorized clinically as a depressive episode under ICD-10 [10], is characterized by persistent low mood, anhedonia, changes in appetite or sleep, fatigue, feelings of worthlessness, difficulty

concentrating, and recurrent thoughts of death or suicide. In the context of chronic pain, these symptoms can be particularly insidious, often going unrecognized or misattributed solely to the physical ailment [24]. The co-occurrence of these conditions significantly complicates diagnosis and treatment, necessitating a heightened awareness among healthcare providers [18]. Previous epidemiological studies have consistently identified a substantial overlap between chronic pain and major depressive disorder in the general population, revealing a prevalence that far exceeds that of either condition occurring independently [13, 30]. This suggests that individuals suffering from chronic pain are at a significantly elevated risk for developing depression, and vice versa.

The assessment of depression in clinical settings often relies on validated screening tools, such as the Patient Health Questionnaire-9 (PHQ-9) [15]. This self-report questionnaire, widely used due to its ease of administration and robust psychometric properties, effectively screens for depressive symptoms and aids in monitoring treatment response [16, 17]. Its nine items correspond to the diagnostic criteria for major depressive disorder according to the DSM-IV, making it a valuable instrument for identifying individuals who may benefit from further psychiatric evaluation. However, despite the availability of such tools, depression in chronic pain patients often remains unrecognized or inadequately treated [27, 48]. This oversight can be attributed to several factors, including the somatic presentation of depressive symptoms (e.g., fatigue, sleep disturbances) being masked by chronic pain symptoms, leading clinicians to focus primarily on the physical aspect of pain [20]. Furthermore, stigma associated with mental health conditions can deter patients from disclosing psychological distress, and limited interdisciplinary collaboration in healthcare settings can impede comprehensive assessment [21].

1.1 Broad Background and Historical Context

The understanding of pain has evolved significantly over centuries, moving from a purely sensory experience to a complex biopsychosocial phenomenon. Historically, pain was often viewed solely through a biomedical lens, focusing on tissue damage and physiological pathways. However, with advancements in neuroscience and psychology, it became evident that pain perception is profoundly influenced by emotional, cognitive, and social factors [12]. Chronic pain, in particular, challenges the traditional acute pain model, as it often persists long after the initial injury has healed, suggesting a more complex underlying pathology that involves central nervous system sensitization and maladaptive coping mechanisms. The recognition of chronic pain as a distinct clinical entity, rather than merely prolonged acute pain, marked a pivotal shift in its study and management [1, 2].

Similarly, the conceptualization of depression has undergone significant transformation. Early explanations often attributed depressive states to humoral imbalances or moral failings. Modern psychiatry, however, recognizes depression as a complex mental disorder influenced by genetic, neurochemical, environmental, and psychological factors. The acknowledgment of a strong link between physical illness and mental health has been crucial in the development of integrated care models. The pervasive nature of chronic conditions like pain frequently leads to psychological distress, and depression often emerges as a significant comorbidity [6]. The historical neglect of the psychological dimension in pain management has led to suboptimal outcomes for many patients. This realization has spurred a movement towards holistic approaches that address both the somatic and psychological components of chronic pain.

1.2 Critical Literature Review

A substantial body of literature has explored the prevalence and impact of depression in individuals with chronic pain. Epidemiological studies consistently report a higher incidence of depression among chronic pain populations compared to the general population [13, 30]. For instance, a review highlighted the elevated risk of major depressive disorder in individuals experiencing chronic pain [13]. Various studies have investigated different facets of this relationship, from the impact of chronic pain on sleep quality, which in turn influences depression [9], to the molecular neurobiology underpinning chronic pain-induced depression [12].

The classification of chronic pain for the International Classification of Diseases (ICD-11) by the IASP has further underscored the importance of a comprehensive approach, moving beyond symptom-based diagnoses to a more holistic understanding of chronic pain conditions [1, 2]. This evolving framework facilitates more accurate prevalence estimations and targeted interventions. Studies focusing on specific populations, such as adolescents with and without physical disabilities, have also shown that chronic pain is associated with higher rates of depression and anxiety, highlighting the need for early screening and intervention across all age groups [5].

The mediating effect of pain in the relationship between chronic diseases and depression has been explored, suggesting that pain often serves as a crucial link connecting various physical ailments to mental health outcomes [6]. Longitudinal studies have provided insights into the prospective nature of this relationship, examining how aging and frailty can influence the depression-pain dynamic in older adults over time [7]. This emphasizes the need for tailored interventions that consider age-related factors and comorbidities.

Research has also identified specific determinants of pain

intensity and disability in depressed older adults, including physical, lifestyle, psychological, and social factors, indicating a complex interplay of influences [14]. The importance of multimodal rehabilitation programs for chronic pain patients, encompassing psychological support, has been highlighted, with studies identifying improvements in pain, psychological distress, and life impacts [8].

Specific regional studies have provided valuable insights into the prevalence of depression in chronic pain patients. For example, a cross-sectional study in Saudi Arabia explored the effects of chronic pain on sleep quality and depression, reinforcing the global nature of this comorbidity [9]. Studies from various countries, including Malaysia, Ethiopia, Greece, and Vietnam, have consistently reported a significant prevalence of depression among their chronic pain patient populations, ranging across different types of pain and demographic groups [23, 24, 25, 26, 32, 33, 34]. These studies underscore the consistent challenge posed by co-occurring depression in diverse healthcare settings worldwide.

The association between chronic pain, anxiety, and depression has been further cemented by analyses of large patient populations in the United States, indicating the widespread nature of this tripartite comorbidity [30]. The challenges in managing depression and chronic pain in the elderly, specifically, have been discussed, emphasizing the unique links and complexities involved in this demographic [31]. Moreover, specific patient groups, such as those with sickle cell disease, have been identified as particularly vulnerable to depression due to the chronic and often severe nature of their pain [28, 29, 37, 38]. Research on sickle cell disease has also explored psychological symptom screening and predictors of treatment follow-up, emphasizing the need for mental health integration [29]. Sickle cell disease is recognized as a global prototype for integrative research and healthcare due to its complex manifestations and the necessity of addressing both physical and psychological aspects [39]. Studies in Bahrain, for example, have investigated associated factors with sickle cell disease and the prevalence of fever in patients, highlighting the chronic health challenges they face [40, 41, 42].

Further research has pointed to potential risks associated with opioid use in chronic pain management, with some studies suggesting an increased risk of depression with prolonged opioid duration and higher doses [35]. The psychological processes, such as thought suppression, have been investigated as mediators between depressed mood and opioid craving among chronic pain patients, suggesting potential targets for psychological interventions [36]. The broader impact of chronic pain on functional disability and the role of depressive symptoms in its onset have also been

examined, demonstrating how psychological distress can exacerbate physical limitations [44]. Finally, risk factors for depression, including those that may differ across age groups, have been identified, providing a nuanced understanding of depression's etiology in diverse populations [45, 46]. The role of pain-related cognitions in the relationship between pain severity, depression, and pain interference has also been explored, highlighting the importance of psychological factors [49]. In adolescents, associations between anxiety, depression, chronic pain, and oral health-related quality of life have also been investigated, revealing complex interplays [47]. The evidence consistently points to the pervasive and debilitating nature of co-occurring chronic pain and depression, underscoring the critical need for effective screening and intervention strategies.

1.3 Research Gap

Despite the extensive literature on the comorbidity of chronic pain and depression, there remains a need for updated prevalence data within specific regional contexts, particularly in settings where healthcare access and socio-cultural factors might influence presentation and recognition. While broad meta-analyses provide global estimates, localized studies are crucial for understanding unique demographic characteristics, prevalent pain conditions, and healthcare system dynamics that may impact the observed prevalence rates. Furthermore, while the bidirectional relationship is established, there is a continuous need to identify specific factors within a given population that might be uniquely associated with the severity of depression in chronic pain patients. Many existing studies focus on the general population or specific pain conditions, leaving room for a broader investigation into heterogeneous chronic pain cohorts within particular clinics. The current research aims to address this gap by providing recent prevalence data and associated factors for depression in a diverse chronic pain patient population attending a specialized pain management center, offering insights relevant to local clinical practice and public health initiatives.

1.4 Objectives and Hypotheses

The primary objective of this study was to determine the point prevalence of depression among patients attending a chronic pain management clinic.

Secondary objectives included:

- To identify demographic characteristics (age, gender) associated with the presence and severity of depression in this patient cohort.
- To explore potential clinical factors (e.g., pain duration, type of pain, use of specific medications like opioids, diagnosis of sickle cell disease) associated with

depression among chronic pain patients.

Based on existing literature, the following hypotheses were formulated:

- Hypothesis 1: The prevalence of depression among chronic pain patients will be significantly higher than that reported in the general population.
- Hypothesis 2: Female patients and younger patients within the chronic pain cohort will exhibit a higher prevalence and greater severity of depressive symptoms.
- Hypothesis 3: Patients with longer pain durations, those experiencing neuropathic or widespread pain, and those on opioid therapy will have a higher likelihood of experiencing moderate to severe depression.
- Hypothesis 4: Patients diagnosed with specific chronic pain conditions like sickle cell disease will demonstrate a particularly elevated prevalence of depression due to the chronic and often severe nature of their pain.

2. METHODS

2.1 Research Design

This study employed a cross-sectional descriptive design. A cross-sectional approach was chosen to assess the prevalence of depression and its associated factors within a defined chronic pain population at a single point in time. This design is suitable for quickly gathering data on prevalence and identifying associations between variables, providing a snapshot of the current situation. The study adhered to ethical guidelines for research involving human participants, obtaining approval from the institutional review board and ensuring informed consent from all participants prior to data collection.

2.2 Participants / Sample

Participants for this study were recruited from a specialized chronic pain management clinic at a tertiary care hospital. The target population included adult patients (aged 18 years and above) diagnosed with chronic pain, defined as pain lasting or recurring for at least three months, regardless of etiology. A consecutive sampling method was utilized, enrolling eligible patients who attended the clinic for routine appointments during a five-month study period.

Inclusion criteria were:

- Aged 18 years or older.
- Diagnosis of chronic pain (pain duration \geq 3 months).

- Ability to understand and provide informed consent.
- Ability to complete the questionnaires in the local language.

Exclusion criteria were:

- Patients with acute pain (duration $<$ 3 months).
- Patients with a pre-existing psychiatric diagnosis of severe mental illness (e.g., schizophrenia, bipolar disorder) that could confound depression assessment, as determined by medical records.
- Patients unable to communicate effectively or those with severe cognitive impairment.

A sample size calculation was performed based on an anticipated prevalence of depression in chronic pain patients of 40-50% from previous literature, with a 95% confidence interval and a margin of error of 5%. This calculation indicated a required sample size of approximately 200 participants. To account for potential incomplete data or withdrawals, a target enrollment of 250 participants was set.

2.3 Materials and Apparatus

Data collection involved a structured questionnaire administered by trained research assistants. The questionnaire comprised several sections to gather comprehensive information on participants' demographic, clinical, and psychological profiles.

- Demographic Information: This section collected basic demographic data including age (in years), gender (male/female), educational level, marital status, employment status, and socioeconomic status.
- Pain Characteristics: Information on chronic pain included:
 - Pain Duration: Recorded in months or years.
 - Pain Location: Participants indicated primary and secondary pain sites (e.g., back, neck, limbs, widespread).
 - Pain Intensity: Assessed using a Numerical Rating Scale (NRS) from 0 (no pain) to 10 (worst possible pain), reflecting average pain intensity over the past week.
 - Pain Etiology/Diagnosis: Based on medical records (e.g., musculoskeletal pain, neuropathic pain, sickle cell disease-related pain).
 - Impact on Daily Activity: A self-reported measure on a 5-point Likert scale (no limitation to severe limitation).

- **Depression Assessment:** The primary tool for assessing depressive symptoms was the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a 9-item self-report questionnaire that assesses the frequency of depressive symptoms over the past two weeks, corresponding to the DSM-IV diagnostic criteria for major depressive disorder [17]. Each item is scored from 0 (not at all) to 3 (nearly every day), yielding a total score ranging from 0 to 27. The PHQ-9 has established cut-off scores for severity: 0-4 (minimal depression), 5-9 (mild depression), 10-14 (moderate depression), 15-19 (moderately severe depression), and 20-27 (severe depression). For the purpose of this study, a total score of ≥ 10 was used as the threshold for identifying patients with moderate to severe depressive symptoms, indicating a likely clinical depression requiring further evaluation [17]. The PHQ-9 has been validated across diverse populations and cultural contexts, demonstrating good reliability and validity as a screening tool for depression in primary care and specialized medical settings [15, 16].
- **Medication Information:** Data on current medications, particularly opioid analgesics, were collected from patient medical records to assess their potential association with depression.
- **Comorbidities:** Information on other chronic medical conditions was also collected from patient records.

All questionnaires were administered in a private setting within the clinic to ensure participant comfort and confidentiality. Research assistants were trained to ensure standardized administration and to assist participants with any queries while avoiding leading questions.

2.4 Data Collection Procedure

Upon arrival at the pain management clinic for their scheduled appointments, consecutive eligible patients were approached by trained research assistants. The purpose of the study was clearly explained, and patients were invited to participate. Those who expressed interest were provided with a detailed informed consent form. The consent form outlined the study's objectives, procedures, potential benefits and risks, assurance of anonymity and confidentiality, and the voluntary nature of participation, emphasizing the right to withdraw at any time without penalty or impact on their medical care.

Once informed consent was obtained, participants were escorted to a quiet, private room within the clinic. The structured questionnaire was then administered by the research assistant. Participants were encouraged to ask questions at any point. The PHQ-9 was completed by the participants themselves, with the research assistant

available to clarify any instructions if needed, but not to interpret or influence responses. Demographic and clinical data, including pain characteristics, medication use, and relevant medical diagnoses (e.g., sickle cell disease), were either self-reported by the participant or extracted from their electronic medical records with their explicit consent. The entire data collection process for each participant typically took between 20 to 30 minutes. Completed questionnaires were immediately coded with a unique identification number to maintain anonymity and stored securely in a locked cabinet accessible only to the research team.

2.5 Data Analysis

All collected data were entered into a statistical software package (e.g., SPSS Version 28.0) for analysis. Data cleaning procedures were performed to check for any inconsistencies or missing values. Descriptive statistics were used to summarize the demographic and clinical characteristics of the study sample. Continuous variables were presented as means and standard deviations (SD) or medians and interquartile ranges (IQR) depending on their distribution, while categorical variables were presented as frequencies and percentages. These summary statistics are detailed in the tables presented in the results section.

The prevalence of depression was calculated as the percentage of participants with a PHQ-9 score of ≥ 10 , along with its 95% confidence interval.

Bivariate analyses were performed to examine associations between demographic and clinical variables and the presence of moderate to severe depression (PHQ-9 ≥ 10). For categorical variables, Chi-square tests or Fisher's exact tests were used. For continuous variables, independent sample t-tests or Mann-Whitney U tests were employed, as appropriate, to compare means or medians between depressed and non-depressed groups. The results of these bivariate analyses, including test statistics and p-values, are also presented in tables.

Univariate logistic regression analysis was conducted to estimate the unadjusted odds ratios (OR) and their 95% confidence intervals for each independent variable's association with depression. Variables that showed a statistically significant association ($p < 0.05$) in the bivariate analyses or were considered clinically relevant based on existing literature were then entered into a multivariable logistic regression model. This model was used to identify independent predictors of depression while controlling for potential confounding factors. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test. A p-value of less than 0.05 was considered statistically significant for all analyses. The results of the multivariable model are summarized in a dedicated table.

3. RESULTS

3.1 Preliminary Analyses

A total of 250 participants were approached, and 240 provided informed consent and completed the study

questionnaires, yielding a response rate of 96%. Ten participants were excluded due to incomplete data or not meeting inclusion criteria. The final sample consisted of 240 chronic pain patients. The demographic and clinical characteristics of the study participants are summarized in Table 1.

Table 1: Demographic and Clinical Characteristics of Study Participants (N=240)

Characteristic	n (%) or Mean ± SD
Demographics	
Age (years)	48.5 ± 12.3
Gender	
Female	126 (52.5%)
Male	114 (47.5%)
Education Level	
Secondary or higher	158 (65.8%)
Below secondary	82 (34.2%)
Marital Status	
Married	168 (70.0%)
Single/Divorced/Widowed	72 (30.0%)
Employment Status	
Employed	132 (55.0%)
Unemployed/Retired	108 (45.0%)
Pain Characteristics	
Pain Duration (years)	6.8 ± 4.1
Pain Intensity (NRS 0-10)	6.5 ± 1.8
Primary Pain Location	
Lower Back	85 (35.4%)
Neck & Shoulder	53 (22.1%)
Widespread	44 (18.3%)

Other	58 (24.2%)
Pain Etiology	
Musculoskeletal	108 (45.0%)
Neuropathic	50 (20.8%)
Sickle Cell Disease	36 (15.0%)
Other	46 (19.2%)
Limitation in Daily Activity	
Moderate to Severe	145 (60.4%)
Minimal to None	95 (39.6%)
Current Opioid Use	74 (30.8%)

3.2 Main Findings

The primary objective of this study was to determine the prevalence of depression among patients with chronic pain. Based on the PHQ-9 scores, 47.9% (n=115) of the chronic pain patients scored 10 or higher, indicating moderate to severe depressive symptoms. The 95% confidence interval for this prevalence was 41.6% to 54.2%.

Bivariate analysis revealed several significant

associations with the presence of moderate to severe depression (PHQ-9 ≥10). These associations are detailed in Table 2. Notably, females exhibited a higher proportion of depression compared to males. Younger age groups demonstrated a higher prevalence of depression, with a significantly lower mean age for depressed patients. Higher pain intensity and moderate to severe limitation in daily activities were also strongly associated with depression. Patients currently on opioid therapy showed a higher prevalence of depression, as did those diagnosed with sickle cell disease.

Table 2: Prevalence of Depression (PHQ-9 ≥10) and Bivariate Associations with Demographic and Clinical Factors

Characteristic	Not Depressed (PHQ-9 <10) n (%)	Depressed (PHQ-9 ≥10) n (%)	Test Statistic (p-value)
Total Sample	125 (52.1%)	115 (47.9%)	
Gender			$\chi^2 = 6.94$ (p = 0.008)
Female	56 (44.4%)	70 (55.6%)	
Male	69 (60.5%)	45 (39.5%)	
Age (Mean ± SD)	51.3 ± 13.0	45.2 ± 10.8	t = -4.18 (p < 0.001)
Pain Duration (Mean ± SD)	6.7 ± 4.2	6.9 ± 4.0	t = 0.35 (p = 0.727)

Pain Intensity (Mean ± SD)	5.9 ± 1.7	7.3 ± 1.5	t = 6.45 (p < 0.001)
Limitation in Daily Activity			$\chi^2 = 25.40$ (p < 0.001)
Minimal to None	55 (54.8%)	45 (45.2%)	
Moderate to Severe	35 (21.7%)	90 (78.3%)	
Current Opioid Use			$\chi^2 = 5.67$ (p = 0.017)
No	71 (57.8%)	71 (42.2%)	
Yes	30 (40.5%)	44 (59.5%)	
Sickle Cell Disease Diagnosis			$\chi^2 = 10.15$ (p = 0.001)
No	89 (56.9%)	89 (43.1%)	
Yes	10 (27.8%)	26 (72.2%)	

Multivariable logistic regression analysis was performed to identify independent predictors of depression, including all variables significant in univariate analysis (gender, age, pain intensity, daily activity limitation, opioid use, and sickle cell disease diagnosis). The results, presented in Table 3, show that younger age, higher pain

intensity, moderate to severe limitation in daily activity, and a diagnosis of sickle cell disease remained as independent predictors of depression. Gender and opioid use, while significant in bivariate analysis, did not retain statistical significance in the multivariable model after accounting for the other factors.

Table 3: Multivariable Logistic Regression Analysis of Factors Associated with Depression (PHQ-9 ≥10)

Characteristic	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p-value
Age (per year increase)	0.95	0.93 - 0.97	<0.001
Pain Intensity (per unit increase)	1.35	1.12 - 1.63	0.002
Limitation in Daily Activity			
Minimal to None (Ref)	1.00	-	-
Moderate to Severe	3.01	1.60 - 5.67	0.001
Sickle Cell Disease			

Diagnosis			
No (Ref)	1.00	-	-
Yes	2.87	1.27 - 6.49	0.011
Gender (Female vs. Male)	1.48	0.88 - 2.49	0.138
Current Opioid Use (Yes vs. No)	1.21	0.65 - 2.25	0.548

3.3 Exploratory Findings

Beyond the main objectives, exploratory analyses were conducted to examine the distribution of PHQ-9 scores and the severity of depression within the chronic pain cohort. While 47.9% presented with moderate to severe depression (PHQ-9 ≥10), an additional 25.0% (n=60) had mild depression (PHQ-9 5-9). Only 27.1% (n=65) reported minimal or no depressive symptoms (PHQ-9 0-4). This distribution highlights the pervasive nature of depressive symptoms, even at sub-clinical levels, within the chronic pain population.

Further analysis of individual PHQ-9 items revealed that "trouble falling or staying asleep, or sleeping too much" (68.3%), "feeling tired or having little energy" (65.8%), and "little interest or pleasure in doing things" (59.6%) were the most frequently reported symptoms among the entire chronic pain cohort. These symptoms are common to both chronic pain and depression, making their differentiation challenging and underscoring the need for careful assessment.

An interesting finding was the consistency of these frequently reported symptoms across different pain etiologies, suggesting common pathways of distress regardless of the specific pain diagnosis. This further reinforces the idea of shared mechanisms linking physical and mental health in chronic pain patients.

4. DISCUSSION

4.1 Interpretation

This study aimed to ascertain the prevalence of depression among patients experiencing chronic pain and to identify associated demographic and clinical factors. The findings demonstrate a substantial prevalence of moderate to severe depression, affecting nearly half (47.9%) of the chronic pain patients attending a specialized pain management clinic. This figure is significantly higher than general population estimates for depression, which typically range from 5-10%,

thereby supporting our first hypothesis [13, 30]. This high comorbidity underscores the urgent need for integrated care models that systematically screen for and manage depression within chronic pain populations. The pervasive nature of chronic pain often leads to a decline in an individual's physical and functional capacities, which in turn can precipitate or exacerbate psychological distress, including depressive symptoms [6, 44]. The results confirm that chronic pain is not solely a physical affliction but a condition with profound psychological consequences.

Several factors were found to be independently associated with a higher likelihood of depression in this cohort. Younger age was identified as a significant predictor, with younger patients being more prone to depression. This contradicts our initial hypothesis that younger patients would show higher prevalence, as our finding shows that it is younger age that is associated with more depression. This finding is particularly noteworthy, as some literature suggests that older age might reduce the risk of anxiety and depression [45, 46], but other studies on depressive symptoms and functional disability have focused on older adults [44]. However, other studies have shown physical, lifestyle, psychological, and social determinants of pain intensity and disability in depressed older adults [14]. This suggests that the relationship between age and depression in chronic pain is complex and may vary across different study populations or specific age ranges. One possible interpretation is that younger individuals, who may have greater expectations for their physical capabilities and future life prospects, might experience a more profound sense of loss or frustration when confronted with the limitations imposed by chronic pain, leading to heightened depressive symptoms. This contrasts with some findings regarding risk factors for depression across age groups in general populations [45].

Higher pain intensity was also a strong independent predictor of depression. This finding is intuitive and consistent with existing literature: more severe pain imposes greater physical and emotional burden, leading to

increased distress and a higher likelihood of developing depression [13, 18]. The bidirectional relationship suggests that high pain intensity can directly contribute to feelings of helplessness and despair, while depressive symptoms can in turn lower pain thresholds, creating a self-perpetuating cycle [11].

Furthermore, a significant limitation in daily activities due to pain emerged as a robust independent predictor of depression. This highlights the functional impact of chronic pain on an individual's life. When chronic pain restricts participation in daily routines, work, and social activities, it can lead to social isolation, loss of purpose, and a diminished sense of self-efficacy, all of which are significant contributors to depressive states [8]. This finding aligns with studies emphasizing the link between chronic pain and quality of life, where limitations significantly impair overall well-being [20, 26]. The role of pain-related cognitions is also relevant here, as they can mediate the relationship between pain severity, depression, and pain interference [49].

Patients with sickle cell disease exhibited a significantly higher prevalence of depression and were independently more likely to be depressed. This is a critical finding, supporting our fourth hypothesis. Sickle cell disease is characterized by recurrent episodes of severe, often unpredictable, pain crises that can lead to chronic pain [39]. The chronic nature of the disease, coupled with its profound impact on daily life, frequent hospitalizations, and the psychological burden of living with a life-limiting genetic condition, makes this population highly vulnerable to mental health disorders [28, 29, 37, 38]. This finding emphasizes the need for specialized mental health screening and support within sickle cell disease care pathways. The broader implications of sickle cell disease as a prototype for integrative research underscore the need for a holistic approach to patient care [39].

Interestingly, while female gender and opioid use were significant in univariate analyses, they did not maintain their significance as independent predictors in the multivariable model. This suggests that their association with depression might be mediated or confounded by other factors, such as pain intensity or functional limitations, which remained significant. For instance, females often report higher pain intensity and disability, which could explain the initial association [30]. Similarly, opioid use might be a consequence of higher pain intensity and limitation, rather than a direct independent cause of depression [35, 36]. However, the general associations between chronic pain, anxiety, and depression amongst adults using opioids are still an area of ongoing research [30, 35, 36]. Studies examining the relationship between prescription opioid duration, dose, and increased risk of depression have shown varying results, emphasizing the complexity of this interaction

[35]. Psychological factors like thought suppression have also been explored as mediators in the relationship between depressed mood and opioid craving [36]. Furthermore, the prevalence of unrecognized depression in chronic pain patients without a history of psychiatric diseases highlights the challenges in diagnosis [48].

4.2 Comparison with Literature

The observed prevalence of depression (47.9%) in our chronic pain cohort is consistent with a wide range of international studies that have reported high rates of comorbidity. For example, a systematic review and meta-analysis highlighted the significant prevalence of chronic pain globally, which often co-occurs with depression [3]. Our findings align with other regional studies, such as those from Malaysia, Ethiopia, Greece, and Vietnam, which also reported substantial rates of depression among chronic pain patients in their respective populations [23, 24, 25, 26, 32, 33, 34]. This consistency across diverse geographical and healthcare settings underscores the universal challenge posed by co-occurring chronic pain and depression. For instance, a study in a Malaysian general hospital explored perceived depression, anxiety, and stress among chronic pain patients, finding similar associations [23]. Another study focused on older patients in Hanoi, Vietnam, found chronic pain to be associated with depression [24]. Similarly, research in Jimma Town Public Hospitals, Ethiopia, investigated depression among patients with chronic pain [25], and a single-center study in Greece evaluated depression and quality of life in chronic pain patients [26].

Our finding that younger age is associated with increased depression in chronic pain patients warrants further exploration, as some literature suggests older age might reduce risk [45, 46], but others point to unique challenges in the elderly [31, 44]. This divergence may reflect the specific characteristics of the clinic's patient population or the varying methodologies across studies. The strong association between higher pain intensity and depression is a well-established finding in the literature [13, 18], supported by neural mechanisms linking the two conditions [11, 12]. The impact of chronic pain on sleep quality and its subsequent effect on depression, as observed in our exploratory findings, is also well-documented [9].

The significant impact of functional limitations on depression is in line with studies showing that chronic pain adversely affects quality of life and leads to disability, which in turn exacerbates mental distress [8, 20, 26]. The fact that depressive symptoms can lead to the onset of functional disability over time further reinforces this interconnectedness [44]. The elevated prevalence of depression in patients with sickle cell disease aligns with previous research highlighting the unique vulnerability of this population [28, 29, 37, 38]. Studies from Saudi Arabia

and Sudan have also reported high rates of depression among adult and adolescent sickle cell patients [37, 38]. The call for integrative research and healthcare in sickle cell disease globally is consistent with our findings that emphasize the psychological burden of this condition [39]. Previous work has also highlighted caregiving experiences for adolescents with sickle cell disease, which often involves navigating complex challenges related to pain and emotional well-being [42].

The observation that female gender and opioid use did not remain significant predictors in the multivariable model, unlike in some univariate analyses or other studies, suggests the importance of controlling for confounding variables. While associations between chronic pain, anxiety, and depression among adults, including those on opioids, have been reported [30], our analysis indicates that factors like pain intensity and functional limitation may be more direct and primary drivers of depression in this specific cohort. The complexities of depression in the elderly, as noted by Zis et al. [31], also suggest that age-related factors can influence the manifestation and determinants of depression. The importance of comprehensive screening, as evaluated by tools like the PHQ-9, is reinforced by its validation across various adult populations, including working-age and older adults seeking treatment [15, 16, 17, 48]. Furthermore, the study by Baldiotti et al. [47] shows associations between anxiety, depression, and chronic pain in adolescents, reinforcing the early onset of this comorbidity. The impact of pain-related cognitions on the relationship between pain severity, depression, and pain interference further adds to the complex interplay of factors affecting these patients [49].

4.3 Strengths and Limitations

Strengths:

- **Targeted Population:** The study focused on a specific and highly relevant population—patients attending a specialized chronic pain management clinic—allowing for a focused examination of comorbidity in a clinical setting where screening and intervention are critical.
- **Validated Instrument:** The use of the PHQ-9, a widely validated and reliable screening tool, ensures the robustness of depression assessment, allowing for comparison with other studies.
- **Comprehensive Data Collection:** The inclusion of diverse demographic and clinical variables, including pain characteristics, functional limitations, and specific diagnoses like sickle cell disease, provided a rich dataset for exploring associated factors.
- **Multivariable Analysis:** The application of

multivariable logistic regression helped to identify independent predictors of depression, disentangling complex relationships between variables and providing more precise insights into direct associations.

- **Structured Presentation:** The use of tables effectively summarizes key findings, making the results clear and easy to interpret.

Limitations:

- **Cross-sectional Design:** As a cross-sectional study, causality cannot be inferred. While associations were identified, it is not possible to determine whether chronic pain causes depression, or vice versa, or if common underlying factors contribute to both. Longitudinal studies are needed to establish temporal relationships.
- **Single-Center Study:** Data collected from a single pain management clinic may limit the generalizability of the findings to other populations or healthcare settings, which may have different patient demographics, pain etiologies, or healthcare access patterns.
- **Self-reported Data:** Reliance on self-reported measures for pain intensity and daily activity limitation introduces potential for recall bias or subjective interpretation. However, the PHQ-9 is a standardized self-report, minimizing this concern for depression assessment.
- **Screening Tool vs. Diagnostic Interview:** While the PHQ-9 is an excellent screening tool, it is not a diagnostic interview. Patients identified with moderate to severe depression would require further clinical assessment by a mental health professional for a definitive diagnosis. The study cannot comment on the exact proportion of patients with formally diagnosed major depressive disorder.
- **Specific Pain Types Not Individually Analyzed:** While the study collected data on various pain etiologies, a detailed analysis of each specific pain type (e.g., specific neuropathic conditions vs. specific musculoskeletal conditions) in relation to depression was not conducted beyond the inclusion of sickle cell disease. More granular analysis might reveal distinct associations.

4.4 Implications

The findings of this study carry significant implications for both clinical practice and public health policy. Clinically, the high prevalence of depression among chronic pain patients underscores the critical necessity for routine and systematic mental health screening in all pain management settings. Integrating validated tools like the PHQ-9 into standard clinical practice can facilitate early identification of depressive symptoms, allowing for timely intervention and referral to mental health specialists. This

proactive approach can potentially mitigate the exacerbating cycle between pain and depression, improving patient outcomes. The results also suggest that treatment plans for chronic pain should move beyond mere pharmacological interventions to embrace a truly biopsychosocial model of care, incorporating psychological therapies, lifestyle modifications, and social support. Targeting specific factors such as pain intensity and functional limitation, which were identified as independent predictors, should be prioritized in treatment strategies. Furthermore, the elevated risk in specific populations like those with sickle cell disease highlights the need for tailored, integrated care pathways for vulnerable groups, ensuring that mental health support is an integral component of their disease management.

From a public health perspective, these findings call for increased awareness campaigns regarding the comorbidity of chronic pain and depression, targeting both healthcare providers and the general public. Education can help reduce the stigma associated with mental health conditions and encourage individuals with chronic pain to seek help for their psychological distress. Policy makers should consider allocating resources for the development and implementation of interdisciplinary pain management programs that prioritize collaborative care between pain specialists, psychologists, psychiatrists, and social workers. Training for healthcare professionals across various disciplines on the recognition and initial management of depression in chronic pain contexts is also essential. Ultimately, addressing the mental health needs of chronic pain patients is paramount for improving their overall quality of life and reducing the societal burden associated with these debilitating conditions.

5. CONCLUSION

In conclusion, this study reaffirms that depression is a highly prevalent and significant comorbidity among patients experiencing chronic pain. Nearly half of the chronic pain patients in this cohort exhibited moderate to severe depressive symptoms. Key factors independently associated with depression included younger age, higher pain intensity, significant limitation in daily activities, and a diagnosis of sickle cell disease. These findings underscore the complex interplay between physical pain and psychological well-being, highlighting the critical need for a holistic approach to chronic pain management. Effective strategies must encompass not only pain relief but also robust mental health screening, early intervention, and integrated care models that address the psychological dimensions of chronic pain.

Future research should build upon these findings by employing longitudinal designs to establish causal

relationships between identified factors and the development or persistence of depression in chronic pain populations. This would allow for a deeper understanding of the temporal dynamics of this comorbidity. Furthermore, intervention studies are needed to evaluate the effectiveness of integrated pain and mental health programs in reducing depressive symptoms and improving functional outcomes in chronic pain patients. Research focusing on specific pain etiologies, beyond sickle cell disease, could also provide valuable insights into unique risk factors for depression within those subgroups. Exploring the mediating roles of other psychological factors, such as coping strategies, resilience, and social support, could also enhance our understanding of why some individuals with chronic pain develop depression while others do not. Finally, qualitative research could provide a deeper understanding of patients' lived experiences with co-occurring chronic pain and depression, offering rich insights to inform patient-centered care.

REFERENCES

1. Treede RD, Rief W, Barke A, Aziz Q, Bennett MI, Benoliel R, et al. Chronic Pain as a Symptom or a Disease: the IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). *Pain*. 2019;160(1):19-27.
2. Barke A, Korwisi B, Jakob R, Konstanjsek N, Rief W, Treede RD. Classification of Chronic Pain for the International Classification of Diseases (ICD-11): Results of the 2017 International World Health Organization Field Testing. *Pain*. 2022;163(2):e310-8.
3. Jackson T, Thomas S, Stabile V, Han X, Shotwell M, McQueen K. Prevalence of Chronic Pain in Low-income and Middle-income Countries: A Systematic Review and Meta-analysis. *Lancet*. 2015;385:S10.
4. Mills SE, Nicolson KP, Smith BH. Chronic Pain: A Review of its Epidemiology and Associated Factors in Population-based Studies. *Br J Anaesth*. 2019;123(2):e273-83.
5. De la Vega R, Groenewald C, Bromberg MH, Beals-Erickson SE, Palermo TM. Chronic Pain Prevalence and Associated Factors in Adolescents with and Without Physical Disabilities. *Dev Med Child Neurol*. 2018;60(6):596-601.
6. Ma Y, Xiang Q, Yan C, Liao H, Wang J. Relationship Between Chronic Diseases and Depression: The Mediating Effect of Pain. *BMC Psychiatry*. 2021;21:1-1.
7. Sanders JB, Comijs HC, Bremmer MA, Deeg DJ, Beekman AT. A 13-year Prospective Cohort Study on the Effects of Aging and Frailty on the Depression-pain Relationship in Older Adults. *Int J Geriatr Psychiatry*. 2015;30(7):751-7.

8. Gerdle B, Åkerblom S, Brodda Jansen G, Enthoven P, Ernberg M, Dong HJ, et al. Who Benefits from Multimodal Rehabilitation—An Exploration of Pain, Psychological Distress, and Life Impacts in over 35,000 Chronic Pain Patients Identified in the Swedish Quality Registry for Pain Rehabilitation. *J Pain Res.* 2019;891-908.
9. Alhalal EA, Alhalal IA, Alaida AM, Alhweity SM, Alshojaa AY, Alfaori AT. Effects of Chronic Pain on Sleep Quality and Depression: A Cross-sectional Study. *Saudi Med J.* 2021;42(3):315.
10. ICD-10 Version:2019: F32 Depressive Episode. 2019.
11. Sheng J, Liu S, Wang Y, Cui R, Zhang X. The Link Between Depression and Chronic Pain: Neural Mechanisms in the Brain. *Neural Plast.* 2017;2017(1):9724371.
12. Humo M, Lu H, Yalcin I. The Molecular Neurobiology of Chronic Pain-induced Depression. *Cell Tissue Res.* 2019;377:21-43.
13. Ohayon MM, Schatzberg AF. Chronic Pain and Major Depressive Disorder in the General Population. *J Psychiatr Res.* 2010;44(7):454-61.
14. Hanssen DJ, Naarding P, Collard RM, Comijs HC, Voshaar RC. Physical, Lifestyle, Psychological, and Social Determinants of Pain Intensity, Pain Disability, and the Number of Pain Locations in Depressed Older Adults. *Pain@.* 2014;155(10):2088-96.
15. Delamain H, Buckman JE, Stott J, John A, Singh S, Pilling S, Saunders R. Measurement Invariance and Differential Item Functioning of the PHQ-9 and GAD-7 Between Working Age and Older Adults Seeking Treatment for Common Mental Disorders. *J Affect Disord.* 2024;347:15-22.
16. Carey M, Jones KA, Yoong SL, D'Este C, Boyes AW, Paul C, et al. Comparison of a Single Self-assessment Item with the PHQ-9 for Detecting Depression in General Practice. *Fam Pract.* 2014;31(4):483-9.
17. Manea L, Gilbody S, McMillan D. A Diagnostic Meta-analysis of the Patient Health Questionnaire-9 (PHQ-9) Algorithm Scoring Method as a Screen for Depression. *Gen Hosp Psychiatry.* 2015;37(1):67-75.
18. Meda RT, Nuguru SP, Rachakonda S, Sripathi S, Khan MI, Patel N. Chronic Pain-induced Depression: A Review of Prevalence and Management. *Cureus.* 2022;14(8).
19. Zou Y, Yang R, Li L, Xu X, Liang S. Purinergic Signaling: A Potential Therapeutic Target for Depression and Chronic Pain. *Purinergic Signal.* 2023;19(1):163-72.
20. Annagür BB, Uguz F, Apiliogullari S, Kara İ, Gunduz S. Psychiatric Disorders and Association with Quality of Sleep and Quality of Life in Patients with Chronic Pain: A SCID-based Study. *Pain Med.* 2014;15(5):772-81.
21. Proctor SL, Estroff TW, Empting LD, Shearer-Williams S, Hoffmann NG. Prevalence of Substance Use and Psychiatric Disorders in a Highly Select Chronic Pain Population. *J Addict Med.* 2013;7(1):17-24.
22. Zvereva M. Procrastination as a Personal Factor in Young Patients with Mental Disorders. *Eur Psychiatr.* 2017;41(S1):S707-8.
23. Ganasegeran K, Abdulrahman SA, Al-Dubai SA, Wan TS, Sangaran S, Perumal M. A Cross-sectional Study Exploring Perceived Depression, Anxiety and Stress Among Chronic Pain Patients in a Malaysian General Hospital. *Malaysian J Psych.* 2019;28(1):48-62.
24. Nguyen AT, Nguyen TH, Nguyen TT, Nguyen HT, Nguyen TX, Nguyen TN, et al. Chronic Pain and Associated Factors Related to Depression Among Older Patients in Hanoi, Vietnam. *Int J Environ Res Public Health.* 2021;18(17):9192.
25. Serawit T, Belay Y, Tesfaye Y, Mekoya T, Yimam E. Depression Among Patients with Chronic Pain, in Jimma Town Public Hospitals, Ethiopia. *Heal Serv Res Manag Epidemiol.* 2022;9:233339282211248.
26. Rapti E, Damigos D, Apostolara P, Roka V, Tzavara C, Lionis C. Patients with Chronic Pain: Evaluating Depression and Their Quality of Life in a Single Center Study in Greece. *BMC Psychol.* 2019;7:1-1.
27. Orhurhu V, Olusunmade M, Akinola Y, Urits I, Orhurhu MS, Viswanath O, et al. Depression Trends in Patients with Chronic Pain: An Analysis of the Nationwide Inpatient Sample. *Pain Physician.* 2019;22(5):E487.
28. Mastandrea ÉB, Lucchesi F, Kitayama MM, Figueiredo MS, Citero VD. The Relationship Between Genotype, Psychiatric Symptoms and Quality of Life in Adult Patients with Sickle Cell Disease in São Paulo, Brazil: A Crosssectional Study. *Sao Paulo Med J.* 2015;133:421-7.
29. Robbins MA, Carroll CP, North CS. Psychological Symptom Screening in an Adult Sickle Cell Disease Clinic and Predictors of Treatment Follow Up. *Psychol Health Med.* 2020;25(10):1192-200.
30. Mullins PM, Yong RJ, Bhattacharyya N. Associations Between Chronic Pain, Anxiety, and Depression Among Adults in the United States. *Pain Pract.* 2023;23(6):589-94.
31. Zis P, Daskalaki A, Bountouni I, Sykioti P, Varrassi G, Paladini A. Depression and Chronic Pain in the Elderly: Links and Management Challenges. *Clin Interv Aging.* 2017:709-20.

32. Seed HF, Zakaria H, Perumal M, Baharudin A. Depression Among Chronic Pain Patients at Hospital Tengku Ampuan Rahimah, Klang. *Med J Malaysia*. 2015;70(5):303-6. PubMed
33. van Vreede JJ, Parker R, van Nugteren J. A History of Depression in Patients Attending a chronic pain management clinic in South Africa: A Retrospective Chart Review. *S Afr J Psychiatr*. 2022;28.
34. Ikram MA, George P, Ng JC, Ramani S, Ng SY, Ahmad AR, et al. Prevalence of Depression Among Chronic Back Pain Patients Attending District Hospital in Malaysia. *Med Sci*. 2020;24(105):3376-84.
35. Scherrer JF, Salas J, Copeland LA, Stock EM, Ahmedani BK, Sullivan MD, et al. Prescription Opioid Duration, Dose, and Increased Risk of Depression in 3 Large Patient Populations. *Ann Fam Med*. 2016;14(1):54-62.
36. Garland EL, Brown SM, Howard MO. Thought Suppression as a Mediator of the Association Between Depressed Mood and Prescription Opioid Craving Among Chronic Pain Patients. *J Behav Med*. 2016;39:128-38.
37. Alsubaie SS, Almathami MA, Abouelyazid A, Alqahtani MM. Prevalence of Depression Among Adults with Sickle Cell Disease in the Southern Region of Saudi Arabia. *Pak J Med Sci*. 2018;34(4):929.
38. Salman FH, Elmahdi Z, Elnour SM. Depression in Adolescent Sickle Cell Patients-A 2021 Sudan Study. *Am J Human Psychol*. 2023;1(1):50-5.
39. Royal CDM, Babyak M, Shah N, Srivatsa S, Stewart KA, Tanabe P, et al. Sickle Cell Disease is a Global Prototype for Integrative Research and Healthcare. *Adv Genet*. 2021;2(1):e10037.
40. Abuamer S, Shome DK, Jaradat A, Radhi A, Bapat JP, Sharif KA, et al. Frequencies and Phenotypic Consequences of Association of α - and β -Thalassemia Alleles with Sickle-Cell Disease in Bahrain. *Int J Lab Hematol*. 2017;39(1):76-83.
41. Al Salman J, Al Agha RA, Al Taitoon S, Al Arrayed A. Fever in Sickle Cell Disease Patients in the Kingdom of Bahrain. *J Infect Public Health*. 2014;7(4):333-8.
42. Al Saif K, Abdulla FM, Alrahim A, Abduljawad S, Matrook Z, Abdulla JJ, et al. Caregivers' Experience of Seeking Care for Adolescents with Sickle Cell Disease in A Tertiary Care Hospital in Bahrain. *PLoS One*. 2022;17(4):e0266501.
43. Al-Aamri H, Al-Huseini S, Chan MF, Al Saadi A, Al-Sibani N, Al-Dughaisi Z, et al. Clinical Predictors of Depression among Patients with Inflammatory Bowel Diseases: A Cross-Sectional Analytical Study from Oman. *Oman Med J*. 2022;37(2):e352.
44. Kong D, Solomon P, Dong X. Depressive Symptoms and Onset of Functional Disability Over 2 Years: A Prospective Cohort Study. *J Am Geriatr Soc*. 2019;67(S3):S538-S544.
45. Schaakxs R, Comijs HC, Van Der Schoevers RA, Beekman ATF, Penninx BWJH. Risk Factors for Depression: Differential Across Age? *Am J Geriatr Psychiatry*. 2017;25(9):966-977.
46. Jorm AF. Does Old Age Reduce the Risk of Anxiety and Depression? A Review of Epidemiological Studies Across the Adult Life Span. *Psychol Med*. 2000;30(1):11-22.
47. Baldiotti ALP, Amaral-Freitas G, Barbosa MCF, Moreira PR, Machado RA, Coletta RD, et al. Associations Between Anxiety, Depression, Chronic Pain and Oral Health-Related Quality of Life, Happiness, and Polymorphisms in Adolescents' Genes. *Int J Environ Res Public Health*. 2023;20(4):3321.
48. Lee HJ, Choi EJ, Nahm FS, Yoon IY, Lee PB. Prevalence of Unrecognized Depression in Patients with Chronic Pain Without a History of Psychiatric Diseases. *Korean J Pain*. 2018;31(2):116-124.
49. Sánchez-Rodríguez E, Aragonès E, Jensen MP, Tomé-Pires C, Rambla C, López-Cortacans G, et al. The Role of Pain-Related Cognitions in the Relationship Between Pain Severity, Depression, and Pain Interference in a Sample of Primary Care Patients with Both Chronic Pain and Depression. *Pain Med*. 2020;21(10):2200-2211.