Original article

Comorbid major psychopathology in chronic pain: a neglected clinical condition? Preliminary, descriptive results from the "P3 study"

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SUMMARY

Objectives

Prevalence of major psychopathology in patients with chronic pain varies widely across studies and is overrated using screening instruments. The main goals of this preliminary, descriptive investigation were: (1) to calculate the prevalence of major psychopathology in adults with chronic pain at the moment of their first contact with an Italian specialist pain clinic, and (2) to explore its relationship with the presence of current psychiatric comorbidity clinically diagnosed by mental healthcare specialists.

Methods

172 patients were recruited within the "Pain Therapy" service" at the Parma University Hospital. They were assessed at entry using the Millon Clinical Multiaxial Inventory-III edition (MCMI-III). MCMI-III cut-off score of ≥ 85 in at least one of the clinical scales indicated the presence of a current major psychiatric syndrome. Clinical and sociodemographic data were also collected. Frequencies and prevalence rates of comorbid psychopathology were reported and discussed.

Results

50 (29.1%) of participants with chronic pain showed MCMI-III scores indicative of a current, clinically relevant psychiatric syndrome, especially anxiety (n = 17; 9.9%) and somatoform (n = 14; 8.1%) disorders. However, only 31 participants (18%; 36.0% of the subsample scoring above 84 in at least one of the MCMI-III clinical scales) had a current, clinically diagnosed psychiatric comorbidity and declared a past specialist mental health contact or a retention in care within psychiatric services.

Conclusions

Although mental disorders are more common in subjects with chronic pain, a large portion of them remain potentially undiagnosed and under-treated. Mental healthcare professionals stably involved in multidisciplinary teams for chronic pain management are thus recommended.

Ke ywords: Chronic pain; Mental disorder; Comorbidity; Psychopathology; MCMI-III

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Published online: December 27, 2025

How to cite this article: Pelizza L, Pupo S, Barbi C, et al. Comorbid major psychopathology in chronic pain: a neglected clinical condition? Preliminary, descriptive results from the "P3 study". Journal of Psychopathology 2025;31:182-190 . https://doi.org/10.36148/2284-0249-1588

Introduction

Mental disorders and *chronic pain* are relevant causes of *disability* worldwide and have negative impact on quality of life and individual psychophysical well-being[1]. These clinical entities frequently *co-occur*, and individuals with chronic pain suffer more commonly from psychiatric illness when compared with the general population[2]. However, this comorbidity showed a considerable *variance* in prevalence, ranging from 10% to

100%, primarily due to inconsistent assessment methods for mental disorders[3]. Indeed, most authors used screening self-reported tools, while others (the minority) more specific scales developed on standardized classification systems[4]. In this respect, screening tools probably overrated some specific aspects of psychopathology (e.g., anxiety, depression, somatic features), especially in individuals treated within specialist pain clinics and suffering from more painful conditions[5].

A more precise knowledge on comorbid psychopathology in chronic pain might therefore produce a relevant improvement in treatments and outcomes. As concurrent psychopathology has proven to be a crucial predictor of worse prognosis in chronic pain[6], also related to reduced pain relief[7], failure to correctly detect comorbid mental disorders may lead to insufficient and ineffective therapies. Indeed, most psychopathological symptoms (such as anxious-depressive features) are now easily accessible to psychotherapy and psychopharmacological treatments, potentially diminishing the risk of chronic pain persistence[8].

Within this conflicting background, the main *goal* of this preliminary, descriptive investigation was to calculate the prevalence of major psychopathologies comorbid with chronic pain in a clinical sample attending a first consultation within an Italian specialist pain service, using a widely used instrument developed on the "Diagnostic and Statistical Manual for mental disorder (DSM) criteria. Additionally, we compared these psychometric rates with the anamnestic prevalence of a current psychiatric comorbidity clinically diagnosed by mental healthcare professionals, speculating that this double comorbidity often remains under-investigated and under-treated. To our knowledge, no previous Italian study systematically comparing these prevalence rates in chronic pain population has been reported in the literature to date.

Materials and methods

Setting and participants

All participants were individuals with chronic pain requiring a first consultation at the "Pain Therapy Service" (PTS) of the *Parma University Hospital* from 1st June 2023 to 31st December 2024. This service is a centralized ("hub") clinic offering intensive and highly specialized treatments for chronic pain, mainly covering the Northern area of the Emilia-Romagna region. It had both day hospital and outpatient modules[7].

Specifically, our participants were consecutively identified and enrolled within a wider clinical study (i.e., the "*P3 study*")[9]. Indeed, the aim of this manuscript was to conduct a preliminary, descriptive, cross-sectional (baseline) analysis of the P3 study data after a year and a half from the start of recruitment. In this respect, The P3 study is an observational, perspective, non-pharmacological cohort investigation specifically examining the baseline prevalence of comorbid psychopathology in individuals with chronic pain, and exploring whether this comorbidity can be considered a predictor of poor prognosis and treatment ineffectiveness. Individuals were primarily referred to the service by their general practitioners or other medical specialists, including those working in the satellite ("spokes") pain centers of the Northern Emilia-Romagna region.

For the specific purposes of this preliminary, descriptive research, *inclusion criteria* were: (a) age 18-65 years and (b) first consultation for chronic pain at the PTS. The study had no specific psychiatric diagnostic specificity. The cut-off of ≤65 years was to exclude older age as a potential confounder for psychopathology.

Exclusion criteria were: (a) inability to give a valid informed consent for the participation in this research, including known intellectual disability, and (b) not being fluent in Italian language.

All participants were volunteers and provided a written informed consent for the inclusion in the study. This research received local ethical approvals ("Area Vasta Emilia-Nord" [AVEN] Ethics Committee protocol no. 20841/2023) and adhered to the 1964 Declaration of Helsinki.

Assessment and measures

The psychopathological assessment included the "Millon Clinical Multiaxial Inventory – III edition" (*MMCI-III*)[10]. It is a 175-item true-false self-report questionnaire developed to provide information on current psychopathology, including specific mental and personality disorders as described in the "Diagnostic and Statistical Manual of Mental Disorder, IV edition, Text Revised" (DSM-IV-TR)[11], for use in adults 18 years of age and older. In this study, we specifically calculated the MCMI-III scales' scores related to the main clinical syndromes in order to examine the *current major psychopathology* corresponding to primary psychiatric diagnoses (Table I). In detail, we used its "Base Rate" (BR) scores that reflect conditional prevalence of these syndromes in the MCMI-III normative sample of psychiatric patients. In order to enhance sensitivity in our analyses, we used a stricter BR threshold (i.e. BR≥85), suggesting the presence of a current, prominent psychiatric syndrome[12]. This allowed us to gauge clinical severity rather than mere presence. Moreover, in the description of MCMI-III prevalence rates, we specifically considered the highest score in the clinical syndrome scales for each patient, also taking into account the hierarchical role of the most severe ones (i.e., major depression, though disorder, and delusional disorder)[12]. In this research, we used the Italian version of the MCMI-III, showing good psychometric

TABLE I. *Brief description of the assessment instruments used in this research.*

The MCMI-III is a 175-item true-false self-report questionnaire developed to provide information on current psychopathology and personality traits, including specific mental disorders as outlined in the DSM-IV-TR. It is used in adults 18 years of age and older who are being evaluated in mental healthcare settings. It is modeled on 14 personality patterns, 10 clinical syndrome scales and 4 validity/response-style scales. For the specific purposes of this research, we specifically considered the MCMI-III scales related to major clinical syndromes (i.e., *anxiety disorder, somatoform disorder, bipolar disorder, dysthymic disorder, alcohol abuse, drug abuse, post-traumatic stress disorder, thought disorder, major depression, and delusional disorder*). This was to investigate the current psychopathology related to primary psychiatric diagnoses as described in an international classification system. The MCMI-III scales were standardized as "Base Rate" (BR) scores, ranging from 0 to 115. BR scores reflect the prevalence of these clinical syndromes in the MCMI-III normative sample of psychiatric patients. BR scores of ≥ 75 suggest the presence of a current, clinically significant psychiatric syndrome, while BR scores of 60 represent the median for all patients. The MCMI-III was already previously used to assess psychopathology and personality traits in clinical samples with chronic pain.
The *sociodemographic/clinical chart* included information on gender, nationality, age at entry, years of education, civil status, living status, occupation, family history of chronic pain, localization and duration of chronic pain, typology of chronic pain, pain treatments, medical and psychiatric comorbidity, use of both analgesic and psychotropic drug, past and current psychiatric contact, retention in care and hospitalization, and past/current substance misuse. Specifically, retention in psychiatric care was specifically defined as the presence of specialist individual treatments provided by private or public mental healthcare services. Psychotropic medications were classified by indication and primary prescriber, so that analgesic adjuvants (e.g., duloxetine, pregabalin) were not confused with treatment of mental disorders.

Note. MCMI-III = Millon Clinical Multiaxial Inventory – III Edition; DSM-IV-TR = Diagnostic and Statistical Manual of mental disorders, IV edition, Text Revised.

properties in Italian clinical populations[13]. Specifically, we preferred the MCMI-III over the newer versions of the instrument due to the MCMI-III's extensive research base and clinical utility. Moreover, the MCMI-III questionnaire has been previously used to assess psychopathology in samples with chronic pain[14].
Furthermore, a *sociodemographic/clinical chart* was also completed during the consultation, capturing a broad range of parameters (see Table I for details).

Procedures and statistical analysis

In accordance with the International Association for the Study of Pain, the presence of *chronic pain* was defined as any experiencing pain that persists or recurs for longer than 3 months[15]. At their first consultation in the PTS, all participants completed the psychopathological assessment and the sociodemographic/clinical chart. The anamnestic presence of a current *psychiatric comorbidity* clinically diagnosed by a mental healthcare specialist was collected from both patients and at least one significant relative, ascertaining the answers through the direct consultation of permissible clinical documents. The time window included the last year. However, all comorbidities were further checked and reformulated according to the DSM-5 criteria[16] using the Structured Clinical Interview for DSM-5 mental disorders, Clinical Version (SCID-5-CV)[17]. Any diagnostic discrepancies were resolved with the assistance of the respective general practitioners.

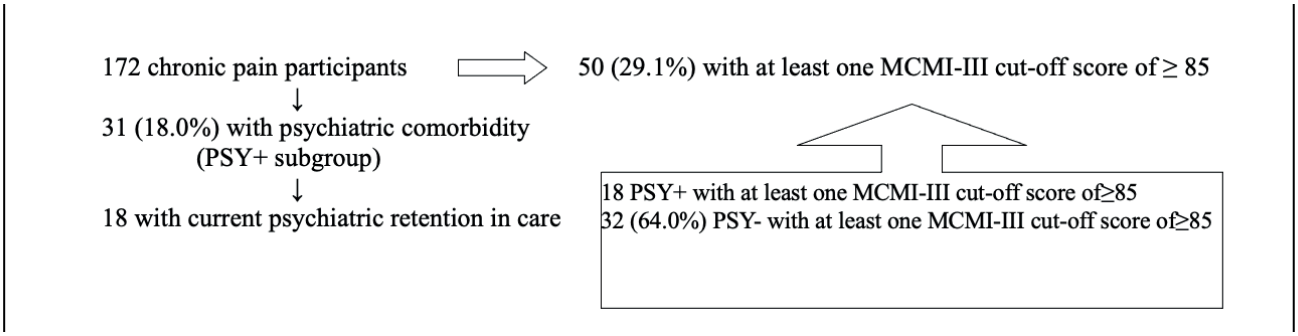

FIGURE 1. *Brief participantflow figure.*
Note. PSY+ = participants with comorbid mental disorder previously assessed by mental health professionals; PSY- = participants without comorbid mental disorder previously assessed by mental health professionals; MCMI-III = Millon Clinical Multiaxial Inventory, III Edition; MCMI-III subscale score of ≥ 85 = presence of a prominent mental disorder.

Collected data were analyzed using the Statistical Package for Social Science (SPSS) 28.0 for Windows[18]. There were no missing data. Frequencies and percentages were reported for qualitative variables, while mean ± standard deviation for continuous variables. The data that support the findings of this examination are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

Results

During the course of the study, 172 patients with chronic pain (113 [65.7%] females, mean age = 46.91±9.55 years) were recruited. Clinical, psychopathological

TABLE II - *Sociodemographic and clinical characteristics of the total sample (n = 172).*

Variables	n (%)	95% CI
Gender (females)	113 (65.7%)	58.1%-72.8%
Age at entry (in years)	46.91±9.55	45.47±6.64-48.35±10.69
Education (in years)	12.67±3.22	12.18±2.91-13.15±3.60
Civil status (married/with partner)	106 (61.6%)	53.9%-63.9%
Employment status (employed)	143 (83.1%)	76.7%-88.4%
Nationality (Italian)	159 (92.4%)	87.4%-95.9%
Localization of chronic pain	93 (54.1%)	46.3%-61.7%
Low back pain	38 (22.1%)	16.1%-29.0%
Widespread pain	16 (9.3%)	5.4%-14.7%
Lower arm pain	11 (6.4%)	3.2%-11.2%
Cervical pain	9 (5.2%)	2.4%-9.7%
Upper arm pain	3 (1.7%)	0.4%-5.0%
Headache/Face pain	2 (1.2%)	0.1%-4.1%
Visceral pain	151 (87.8%)	81.9%-92.3%
ICD-11 diagnoses of chronic pain	86	
Primary chronic pain	35	
Low back pain	19	7.7%-18.1%
Fibromyalgia	8	
Limb pain	3	40.90±104.10-75.54±128.70
Cervical pain	21 (12.2%)	12.6%-23.3%
Chronic migraine	17	
Secondary chronic pain	3	
Secondary musculoskeletal pain	1	
Post-traumatic pain	58.22±115.10	21.3%-35.2%
Cancer-related pain	31 (18.0%)	7.7%-15.4%
Duration of chronic pain (in months)	17	2.8%-10.4%
Psychiatric comorbidity (DSM-5)	4	6.3%-16.0%
Major depressive disorder	3	1.0%-6.7%
Post-Traumatic Stress disorder	2	0.1%-4.1%
Anxiety disorder	2	
Bipolar disorder	1	
Substance abuse disorder	1	
Psychotic disorder	1	
Obsessive-compulsive disorder	18	
Personality disorder	48 (27.9%)	
Current retention in care in mental health services	20 (11.6%)	
Use of psychotropic drug	10 (5.8%)	
Use of psychotropic drug for chronic pain	18 (10.5%)	
Previous psychiatric hospitalization	5 (2.9%)	
Current mental health retention in care	2 (1.2%)	
Past substance abuse		
Current substance abuse		

Note. ICD-11 = International Classification of Diseases, 11th Edition; DSM-5: Diagnostic and Statistical manual of mental disorders; 95% CI = 95% Confidence intervals. Frequencies (and percentages) and mean ± standard deviations are reported. Current retention in care was specifically defined as the presence of current specialist individual treatments provided by private or public mental healthcare services. Psychotropic medications were classified by indication and primary prescriber, so that analgesic adjuvants (e.g., duloxetine, pregabalin) were not confused with treatment of mental disorders.

and sociodemographic features of the total sample are shown in the Table II.

In this investigation, 31 (18.0%) individuals with chronic pain showed a current psychiatric comorbidity previously diagnosed by mental healthcare professional (Figure I). However, only 18 of them declared a current retention in care within specialist mental health services. The most common DSM-5 diagnosis was major depressive disorder (n = 17). Past psychiatric hospitalization was reported in 10 (5.8%) cases, while past substance abuse in 5 (2.9%) cases. Notably, 48 (29.7%) participants with chronic pain showed a psychotropic drug prescription at their first consultation in the PTS service: of them, only 28 (16.3%) mainly for chronic pain management (i.e., antineurophatic pain drug).

As for MCMI-III results, 50 (29.1%) participants had at least one MCMI-III cut-off score of ≥85, indicative of a current, prominent psychiatric syndrome (Figure I). The most prevalent clinical scales were "Anxiety" (n = 17; 34% of the subsample with positive MCMI-III cut-off score), "Somatoform Disorder" (n = 14; 28%), and "Major Depression" (n = 11; 22%) (Table III). Interestingly, 32 participants showing current MCMI-III cut-off scores of ≥85 had no previous comorbid psychiatric diagnosis as previously evaluated by mental health professionals. Finally, all MCMI-III questionnaires were valid (i.e., no MCMI-III "Validity" scores was below 2). No BR score in the "Disclosure" scale was below 34 and above 178 (median [interquartile range] = 52 [35-71]), thus not invalidating clinical profiles[12]. Furthermore, scoring adjustments were automatically made on the MCMI-III syndromes that were affected by high scores (BR > 74) on the "Desirability" and "Debasement" scales, so as not to invalidate clinical profiles[14]. Specifically, median values (and interquartile range) were 35 (30-40) for the "Desirability" scale and 64 (52-71) for the "Debasement" scale.

Discussion

Although comorbid psychiatric illness in chronic pain was an important predictor of poor prognosis[6], their clinical relationship still remains unclear and has been rarely investigated using assessment instruments specifically developed on current international classification systems' diagnostic criteria (such as the DSM). Indeed, most previous investigations on this topic focused primarily on the most common psychological symptoms (such as anxious and depressive features), particularly through the administration of simple screening tools[4]. Not meeting specific diagnostic criteria of widely accepted psychiatric nosography, this approach may lead to overestimate mental disorders in chronic pain, especially depression and anxiety. Therefore, we used a rigorous assessment methodology in examining psychiatric comorbidity, which was based on the DSM diagnostic criteria.

Approximately *a fifth* (18%) of patients firstly consulting our PTS for chronic pain had a current *psychiatric comorbidity* previously assessed by mental healthcare professionals, particularly *major depression* (n = 17; 9.9% of the total sample). This prevalence is lower than what was reported in previous investigations, ranging from 30% (using international classification systems)[19,20] to 60% (using screening tools)[21-23]. Such discrepancies are probably related to differences in sampling methods, assessment instruments, and research designs across studies.

Our investigation included individuals voluntarily recruited within a specialist pain clinic and not necessarily retained in care in mental health services. This may underestimate the prevalence of psychiatric disorders. Notably, only 18 (58.1%) of these participants with a confirmed psychiatric comorbidity had a current retention in care within mental health centers. This supports the

TABLE III - *MCMI-III scores.*

Variables	Total sample (n = 172)	Total sample 95% CI	PSY- (n = 141)	PSY- 95% CI
At least one MCMI-III cut-off score of ≥85	50 (29.1%)	22.4%-36.5%	32 (22.7%)	16.1%-29.9%
A-Anxiety	17 (9.9%)	5.9%-15.4%	12 (8.4%)	4.4%-14.2%
H-Somatoform disorder	14 (8.1%)	4.5%-13.3%	11 (7.8%)	3.9%-13.3%
CC-Major depression	11 (6.4%)	3.2%-11.2%	3 (2.1%)	0.4%-6.0%
PP-Delusional disorder	5 (2.9%)	1.0%-6.7%	4 (2.8%)	0.8%-7.0%
SS-Thought disorder	2 (1.2%)	0.1%-4.1%	1 (0.7%)	0.01%-3.8%
T-Drug dependence	1 (0.6%)	0.01-4.2%	1 (0.7%)	0..1%-3.8%
No psychopathological disorder	1 2 2 (70.9%)	63.5%-77.6%	109 (77.3%)	70.5%-84.6%

Note. MCMI-III = Millon Clinical Multiaxial Inventory, III Edition (MCMI-III subscale score of ≥ 85 = presence of a prominent mental disorder); 95% CI = 95% Confidence Intervals; PSY- = participants without comorbid mental disorder previously assessed by mental health professionals. Frequencies (and percentages) are reported.

idea that a large proportion of subjects with chronic pain are treated by general practitioners[24], probably without obtaining appropriate interventions for their psychopathology (including psychotherapy)[25]. Furthermore, the prevalence of patients taking a *psychopharmacological treatment* at their first consultation in the PTS exceeded those with previously confirmed psychiatric comorbidity (n = 48; 28% of the total sample), especially benzodiazepine and antidepressant drugs, mainly in politherapy. However, only a minority of them (n = 20; 41.7%) specifically used psychotropic medications to treat chronic pain (i.e., antineurophatic pain drug). This suggests that a non-negligible portion of patients with chronic pain may suffer from undiagnosed mental disorders and be treated outside of mental healthcare professionals. Since appropriate treatment for psychopathology certainly improves clinical and functional recovery in subjects with chronic pain, mental healthcare operators (e.g., psychiatrists, psychologists, psychiatric rehabilitation therapists) should be permanently included in multidisciplinary pain treatment teams, particularly to provide in-depth psychopathological assessment, psychotherapy, and clinical-pharmacological monitoring[26].
However, on the other side, a question remains inadequately unexplored: why does *psychiatry continue to ignore* the problem of chronic pain? Among the reasons of this, documented training gaps, service configurations, and co-management barriers can be mentioned[27].
In fact, chronic pain is not usually a key component of clinical psychiatry and psychopathology training programs. Furthermore, psychiatrists sometimes consider psychopathology in chronic pain patients to be primarily secondary to organic factors. This may induces mental healthcare professionals to avoid their direct involvement in pain management. Finally, pain clinicians may be reluctant to give up territory to mental health. All these reasons weaken a constructive interdisciplinary cooperation.Almost a third (29.1%) of our participants showed at least one MCMI-III cut-off score indicative of the presence of a *current, prominent psychiatric syndrome*, especially anxiety, depression, and somatoform disorder. Notably, 32 of them were individuals without a psychiatric comorbidity previously assessed by mental healthcare professionals (specifically, almost two third [64%] of this subgroup). This confirms that a non-negligible portion of patients at their first contact in specialist pain clinics currently suffer from severe psychopathology without having previously received appropriate psychiatric diagnosis/treatment or retention in care within specialized psychiatric services. Including mental health professionals within the multidisciplinary chronic pain teams could fill this diagnostic gap, favor appropriate interventions, and improve pain management and prognosis.In this respect, our prevalence of *depressive disorders* in chronic pain is in line with those reported in previous systematic reviews, with values ranging form 37% to 52% in specialist pain clinics[28-31]. As above mentioned, these discrepancies are related to differences in sampling methods, assessment instruments, and research designs across investigations. Common neurobiological mechanisms in pain and depression have been hypothesized. From this perspective, psychopathology and chronic pain can be considered as comorbid clinical expressions of similar neurobiological alterations, potentially responsive to similar treatments (such as specific antidepressants, which have long been introduced in the treatment of neuropathic pain)[32].
In this regard, some researchers described considerable overlaps in neuroplasticity changes induced by pain and depression[33]. Others observed reduced dopamine reactivity in the limbic system of patients with both chronic pain and depression[34]. Finally, a recent review on neuropsychiatric manifestations of COVID-19 disease and post COVID syndrome suggested the overlapping effects on the glutamatergic system of some adjuvant agents
(i.e., N-acetylcysteine and acetyl-L-carnitine) could help treat COVID-19 psychiatric symptoms and post COVID syndrome, probably acting through different mechanisms on the metabotropic receptor mGluR2 network, with potentially synergistic effects on chronic pain and neuro-astrocyte protection[35]. This further supports the idea of useful supplements at the pain-psychiatry interface.
In this investigation, the prevalence of *anxiety disorders* is at the lower end of the range (16-70%) reported in previous investigations[31,36,37], where the highest rates were detected using screening tools. Likewise, discrepancies in prevalence estimates are probably related to differences in assessment instruments, sampling methods, and designs across examinations. From this perspective, chronic pain would represent a stressful and anxiety-provoking life event that may act both directly and indirectly through the related changes in daily functioning.
However, because pain severity often drive anxiety and depression, adjusting for pain burden (e.g., pain duration and ICD-11 pain category [primary vs secondary chronic pain]) is also important, especially in order to strengthen inference in our exploratory models. Specifically, we incorporated them as covariates in a logistic regression with the presence of MCMI-III “Anxiety” or “depressive” subscale cut-off scores as dependent measures. No significant residual confounding effect was observed (see the Table IV for details).
Finally, the presence of MCMI-III “*Somatoform*” syndrome may recall the clinical characteristics of the DSM-5 definition of “somatic symptom disorder”, which

TABLE IV. *Logistic regression results for acknowledging residual confounding effects of pain burden (i.e., pain duration and ICD-11 pain category [primary vs secondary chronic pain]) on the presence of MCMI-III "Anxiety" or "depressive cut-off scores (n = 172).*

Variables	B	SE	β	OR	p	95% CI for OR Lower bound Upper bound	
Constant	-.234	.180	-.255	.791	.192	.566	1.125
Pain duration (in months)	-.001	.001	-.040	1.000	.800	.997	1.002
ICD-11 pain category (secondary chronic pain)	.362	.470	.326	1.436	.441	.572	3.607
Model for MCMI-III "Anxiety" score as dependent measure: X^2 = .594; Nagelkerke R^2 = .005; Cox & Snell R^2 = .003; p = .441.							
Variables	B	SE	β	OR	p	95% CI for OR Lower bound Upper bound	
Constant	-1.941	.266	-1.684	.144	.001	.085	.242
Pain duration (in months)	.004	.002	.508	1.004	.065	1.000	1,009
ICD-11 pain category (secondary chronic pain)	-.810	.812	-.819	.441	.313	.090	2.164
Model for MCMI-III "Depression" score as dependent measure: X^2 = 1.205; Nagelkerke R^2 = .0.013; Cox & Snell R^2 = ..007; p = .272.							

Note. ICD-11 = International Classification of Diseases, 11th Edition; MCMI-III = Millon Clinical Multiaxial Inventory, III Edition (MCMI-III subscale score of ≥ 85 = presence of a prominent mental disorder); B = estimate; SE = Standard Error; β = standardized estimate; OR = Odds Ratio; p = statistical significance; 95% CI = 95% Confidence Interval; X^2 = Chi-square value. Nagerkerlke R^2 and Cox & Snell R^2 are also reported.

includes "predominant pain" among its specifiers[38]. Psychotherapy could be helpful for these patients[39,40]. However, because overlap between pain phenomenology (e.g., insomnia, fatigue, somatic preoccupation) and psychopathology can increase MCMI-III scores in a pain-clinic cohort, DSM-based prevalence claims need to be tempered.

Limitations

A first limitation was that our clinical population was enrolled within a specialist pain therapy service. This probably involved a highly restricted sample (i.e., adults experiencing the most severe pain intensity and the greatest pain-related disability), introducing the potential of selection bias (such as the over-representation of current psychopathology). In this respect, generalizability of our results is necessarily limited by the tertiary ("hub") context, which likely concentrated more severe and refractory cases, as well as by exclusion of adults over 65, who often suffer from prolonged chronic pain. Second, we used a self-reported tool to assess major psychopathology. Although widely used in psychiatry research, this questionnaire evaluates a state-dependent distress or transient psychiatric features rather than persistent mental disorders. This could open the risk of overestimating acute/transient discomfort compared to chronic disorders. Moreover, we specifically excluded evaluation on personality traits/disorders. Finally, this instrument is specifically anchored to DSM-IV-TR constructs and calibrated on psychiatric clinical samples, meaning its BR scores reflect conditional prevalence in those clinical settings. In a pain-clinic cohort, overlap between pain phenomenology (e.g., insomnia, fatigue, somatic preoccupation) and psychopathology may push MCMI-III scores upward, particularly for the "Somatoform" scale. Therefore, it is necessary to better map the "Somatoform" scale to the DSM-5 "Somatic Symptom Disorder" criteria, also tempering DSM-5-based prevalence statements accordingly.

Third, participation in the study was voluntary. Therefore, some patients with psychiatric comorbidity could be reticent and avoid psychopathological assessment. Finally, because the SCID-5-CV was used only to verify/refine prior diagnoses rather than as a baseline interview

administered to the entire cohort, our investigation effectively compared a self-report inventory with the presence of any diagnosis already formulated in healthcare setting – that is, a measure that was itself shaped by access and documentation rather than by standardized assessment. In this regard, future studies using a structured diagnostic interview applied to all participants (or at least to a randomly selected subsample) are needed. Indeed, in the absence of a reference standard for the entire cohort, positive results on the MCMI-III could reflect genuine unmet need, false positives, symptom fluctuation, recall bias, and/or pain-related distress that increases its endorsement.

Conclusions

The results of this research made evident that more than half of our participants had MCMI-III cut-off scores indicative of a current clinically relevant psychiatric syndrome. Of them, only a minority reported a psychiatric comorbidity previously assessed by mental healthcare professionals. Although not indicative for definitive proof of undiagnosed mental disorders, this evidence suggests the presence of substantial unmet assessment and treatment needs in the chronic pain population. Moreover, as this comorbidity may complicate pain management and prognosis, unmasking undetected psychological suffering helps improve outcomes in chronic pain. The presence of mental health operators in the multidisciplinary team for chronic pain is thus recommended.

Acknowledgments

The authors wish to thank all the participants and family members who actively participated to the P3 study.

Conflict of interest statement

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

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