




Frequency of mental disorders among chronic pain patients with or without fibromyalgia in Japan

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Abstract

Aim: To explore the characteristics of psychiatric morbidity in chronic pain patients who present with or without fibromyalgia.

Methods: Patients are referred to our chronic pain clinic from primary medical institutions, as we are a secondary medical institution. Although some patients have chronic pain, they have no clear organic disorder such as rheumatoid arthritis to account for the pain. Among the 367 new patients seen during the period from March 2009 to August 2012, 347 patients underwent psychiatric evaluation in face-to-face interviews with mental health specialists before a physical examination.

Results: Of the 347 patients examined, at least one psychiatric diagnosis was made for 94.6%. The average number of DSM-IV-TR diagnoses was 1.46 in the 330 chronic pain patients who had at least one psychiatric diagnosis. The breakdown of the number of psychodiagnoses was one in 60.8%, two in 27.1%, three in 4.9%, and more than three in 2.3% chronic pain patients with or without fibromyalgia. In fibromyalgia patients, the highest relative frequencies were found for somatoform disorders (76%), followed by dysthymic disorder (17%) and major depressive disorder (15%). In patients without fibromyalgia, the highest relative frequencies were found for somatoform disorders (64%), followed by major depressive disorder (15%) and dysthymic disorder (14%). Psychiatric disorders were found in 96.9% of fibromyalgia patients, and in 93.5% of chronic pain patients without fibromyalgia in Japan (no significant difference using chi-square test).

Conclusion: Results show that chronic pain patients with or without fibromyalgia are extremely likely to be diagnosed with a psychiatric disorder.

KEYWORDS

dysthymic disorder, interdisciplinary, mental disorders, somatoform disorder

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1 | INTRODUCTION

A relatively high frequency of psychiatric morbidity has been reported in chronic pain patients who often experience anxiety or depression.¹ In the United States, psychiatric and neurological resident programs have begun to administer treatment programs for patients with pain.² It has been reported that patients with pain are more likely to have psychiatric illness.³ Changes to the brain occur with both acute pain and chronic pain, and chronic pain and the attendant human response to stress alter neural activity in terms of affect and cognition.⁴ A strong relationship exists between pain and psychological distress.⁵ Patients with a psychiatric disorder become more opioid dependent or opioid abusing.⁶ Chronic pain patients experience anxiety or depression.⁷ Moreover, experimental studies have examined painful emotions, envy, and schadenfreude.⁸ Functional brain imaging has revealed that psychological “pain of the heart,” such as that associated with bereavement, alters the same areas as physical pain does.⁹ Furthermore, the existence of physical pain produces changes in neural activity associated with reward and aversion.¹⁰

Caution is especially necessary when dealing with cases in which both mental disorder and pain are present. For people with a mental disorder, pain is usually not diagnosed as a disorder in itself but as a symptom of the mental disorder, presenting challenges when differentiating between pain associated with the mental disorder and a somatic symptom disorder.¹¹ A psychiatric evaluation for fibromyalgia patients is particularly important.¹² Reportedly, a pain disorder defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV is analogous to fibromyalgia.¹³ A German study revealed that 26.4% of rheumatoid arthritis patients received a score of 10 or higher on the Patient Health Questionnaire (PHQ)-15, whereas 88.9% of fibromyalgia patients and 9.3% of people without fibromyalgia received the same scores. Furthermore, all fibromyalgia patients met the criteria for DSM-5 somatic symptom disorder.¹² A score of 10 or higher in the PHQ-15 may quantify somatic symptoms and various definitions of somatization syndrome disorders in a patient. However, these reports are of limited use because they are based on results of questionnaire studies, not on results of diagnostic interviews conducted by a psychiatrist. Most such studies focused on the examination of specific psychiatric disorders such as major depressive disorders, personality disorders, and anxiety disorders. Results of earlier studies have been varied.

In this study, having a mental health specialist reach a diagnosis before an examination by a physician allows the physician to differentiate any noteworthy psychiatric disorders. Earlier studies have included little research along with direct interviews by psychiatrists. Therefore, an important aspect of this study is that it considers the results of direct interviews.

2 | METHODS

This study included 347 patients diagnosed by primary physicians as suffering from fibromyalgia or other chronic pain conditions. They

were admitted to the outpatient Rheumatology unit of Yukioka Hospital. Patients who met the inclusion criteria were enrolled in the study after providing verbal consent.

The inclusion criteria were (a) patients who were evaluated by three face-to-face interviews with a psychiatrist; (b) patients who were diagnosed by a rheumatologist.

The exclusion criteria were (a) patients who were seeking a second opinion for a prior consultation; (b) patients who refused a psychiatric evaluation; (c) patients who were diagnosed with a clear organic disorder such as rheumatoid arthritis.

For this study, we did not use a questionnaire. Instead we performed psychiatric diagnosis in face-to-face interviews with mental health specialists. The study protocol was approved by the Ethic Committee of Amagasaki Central Hospital. The method of the study and advantages and potential disadvantages of face-to-face interviews were explained to the participants, and those who gave their written consent participated in the study.

Our chronic pain clinic is located in a secondary medical institution, and typically treats chronic pain patients who are characterized as those experiencing pain lasting ≥ 3 months, and patients who have been referred from primary care clinics. As our clinic serves an area with eight million residents and provides secondary care for fibromyalgia, we only accepted patients referred to us by a primary physician. Some patients did not want to be examined by a mental health specialist before the physical examination, and they accounted for 5.0% of the patients who participated in this study.

No clear organic disorder such as rheumatoid arthritis had been diagnosed by a primary care physician in the patients included in this study. In contrast to existing reports of psychiatric diagnoses of fibromyalgia patients, mental health specialists with expert knowledge of chronic pain initially examined and diagnosed all referred patients prior to a diagnosis of fibromyalgia being made by a physician. All patients reporting chronic pain were interviewed three times by one of the authors of this report, RH, who has 20 years of experience as a psychiatrist, is a Board Certified psychiatrist of The Japanese Society of Psychiatry and Neurology, a Board Certified Trainer of The Japanese Society of Psychiatry and Neurology, and as a Designated Psychiatrist has a National qualification required for psychiatrists concerned with compulsory admissions. Yukioka Hospital is a general hospital without a psychiatry department. All psychiatric diagnoses were performed by RH alone, who served as a part-time attending psychiatrist specifically for the diagnosis of fibromyalgia patients. Diagnostic interviews were conducted three times in total, the first interview lasted about 30-60 minutes, and approximately 30 minutes were taken for the second and third interviews, respectively. Family members, or other persons close to the patient, were also included when the interviews were conducted. When family members or friends were not present at the hospital, their presence was requested in an attempt to carry out an objective diagnosis.

We performed psychiatric assessments and AXIS-I and AXIS-II diagnoses according to DSM-IV-TR. In addition, a multiaxial system of assessment was adopted which might allow for international adoption. This multiaxial psychiatric categorization was conducted



with clinical disorders on the first axis, personality disorders and developmental delays on the second axis, general physical disorders on the third axis, psychosocial and environmental problems on the fourth axis, and overall assessment of function on the fifth axis. Results took the form of multiple diagnoses. Each patient had three visits with a mental health specialist, which yielded the psychiatric diagnosis according to the DSM-IV-TR. Later, each patient had a joint visit with the same mental health specialist, a rheumatologist, and an orthopedic specialist who evaluated the fibromyalgia diagnosis. Fibromyalgia diagnoses were based on the 1990 definition of the American College of Rheumatology. The 2010 American College of Rheumatology diagnostic criteria for fibromyalgia includes other diseases that have psychiatric components. Therefore, this study carefully sought patients with coexisting psychiatric disorders that accorded with the 1990 American College of Rheumatology diagnostic criteria for fibromyalgia and patients who complained of widespread chronic pain. Pathologies that included a complaint of chronic pain but which did not fit the definition of fibromyalgia were categorized as chronic pain syndrome.

2.1 | Statistical analysis

Data were analyzed using Pearson's chi-square test, and unpaired *t* tests for between-group comparisons. All data were analyzed statistically using software (SPSS 24.0; SPSS Inc., Chicago, IL, USA). Results for which $P < 0.05$ were considered significant. Chi-square test was also applied with a confidence interval of 95% to assess the significance of differences between groups.

3 | RESULTS

This study assessed data generated from 347 patients among the 367 new patients examined during March 2009–August 2012. The group included 57 men (16%) and 290 women (84%) with an average age of 47.6 ± 15.6 years. Of the 367 examined patients, 134 were diagnosed with fibromyalgia (12 men (8.9%) and 122 women (91.0%) with an average age of 46.8 ± 15.8 years), 139 were diagnosed with chronic pain syndrome (33 men (23.7%) and, 106 women (76.3%) with an average age 49.5 ± 14.9 years), and 74 were diagnosed with spondyloarthropathy ($n = 33$), polymyalgia rheumatica ($n = 13$), or other conditions ($n = 28$) (12 men (16.2%) and 62 women (83.8%) with an average age of 45.3 ± 14.9 years). By sex, data showed that women composed 91.0% of fibromyalgia patients, 76.3% of chronic pain syndrome patients, and 83.8% of patients with other diagnoses. A significantly higher percentage of women was found among fibromyalgia patients than among chronic pain patients without fibromyalgia ($P < 0.001$) (Table S1).

Our definition of psychiatric medical examinations included both psychiatric and psychosomatic medical consultations. Also, included in this definition were cases in which the patient had received psychiatric treatment in related fields such as neurology based on patient interviews, medical history, and other medical information.

Evaluations from “pain clinics” were not included. The *history of care* variable indicated patients who received psychiatric care in the past, even if only on a single occasion. The *under care* variable denoted patients receiving psychiatric care at the time of the patient's initial visit to our clinic. A substantial share of patients with chronic pain ($n = 347$) was visiting a psychiatrist at the same time ($n = 108$) or earlier ($n = 88$), although 151 patients had never received psychiatric care. Therefore, over half of the chronic pain patients included in this study either had a history of psychiatric care, or were under care, at the time of their initial examination at our outpatient chronic pain clinic, an extremely high proportion (Table 1).

Psychotropic drugs were prescribed at the time of the initial examination for 197 cases of patients with chronic pain (Table 1). Our definition of psychotropic drugs is as follows: antidepressants such as tricyclic antidepressants, selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake inhibitors, sulpiride; anti-anxiety drugs such as benzodiazepine; sleep medications such as non-benzodiazepine, zolpidem; anti-psychotic drugs including atypical and typical anti-psychotic drugs; and mood-stabilizing drugs such as lithium, valproic acid, and carbamazepine but not including anti-convulsants such as gabapentin. Of 134 patients with fibromyalgia, 78 persons (58%) were administered psychotropic drugs. In contrast, of 139 patients with chronic pain syndrome, 78 persons (56%) were prescribed psychotropic drugs as well. No significant difference was found between the presence of fibromyalgia and the administration of psychotropic drugs using chi-square tests. Regarding the relationship between psychotropic drugs and the patient already being under psychiatric care or having a history of psychiatric care at the time of the initial examination, of the 108 patients under psychiatric care, 105 (97.2%) had been given prescriptions for psychotropic drugs. Patients currently undergoing treatment with a mental health specialist were significantly more likely to be under the administration of psychotropic drugs ($p < .001$) (Table 1). At the initial examination of our chronic pain outpatients, about 57% of all patients had already been evaluated in a psychiatric consultation. Moreover, at the time of the initial examination, about 57% of all chronic pain patients were taking psychotropic drugs, 30% of fibromyalgia patients were currently under psychiatric care, and 30% had a history of psychiatric care. In addition, 57% of fibromyalgia patients had drug therapy with psychotropic drugs (Tables 1 and 2). No

TABLE 1 Psychotropic drugs and psychiatric care: patients who receive psychiatric care are frequently prescribed psychotropic drugs

	Present visit of psychiatric care	History of psychiatric care	No history of psychiatric care
Total 347 pts	108 pts (31.1%)	88 pts (25.4%)	151 pts (43.5%)
With psychotropic drugs 197 pts (56.8%)	105 pts (97.2%)	40 pts (45.4%)	52 pts (34.4%)
Without psychotropic drugs 150 pts (43.2%)	3 pts (2.8%)	48 pts (54.5%)	99 pts (65.6%)

**TABLE 2** Psychotropic drugs and psychiatric care

	Fibromyalgia		Other than fibromyalgia	
	With psychotropic drugs	Without psychotropic drugs	With psychotropic drugs	Without psychotropic drugs
Present visit of psychiatric care	40 pts (100%)	0 pts (0%)	39 pts (95.1%)	2 pts (4.9%)
History of psychiatric care	19 pts (47.5%)	21 pts (52.5%)	13 pts (33.3%)	16 pts (66.7%)
No history of psychiatric care	19 pts (35.2%)	35 pts (64.8%)	26 pts (37.3%)	43 pts (62.3%)

relationship was found between the presence or absence of fibromyalgia and whether or not psychotropic drugs had been administered ($p = 0.4$) (Table 2).

We performed psychiatric assessments and diagnoses according to DSM-IV-TR on the 347 consecutive pain outpatients who participated in this study. At least one psychiatric diagnosis was found in 94.6% of the 347 patients. Psychiatric disorders were found in 96.9% of fibromyalgia patients, and in 93.5% of chronic pain patients without fibromyalgia, showing no significant difference. The average number of DSM-IV-TR diagnoses was 1.46 in the 330 chronic pain patients who had at least one psychiatric diagnosis (Table 3). Our definition of psychodiagnostics is used based on the diagnostic standards of the American Psychiatric Association. Many examples of co-occurrence with two or more diagnoses were found. When a

psychiatric disorder was diagnosed, the most likely diagnosis was chosen. Of patients reporting chronic pain, only 5.4% were psychodiagnosed as not having any psychiatric disorder.

Somatoform disorders were present at the highest relative frequency in all 330 chronic pain patients, followed by dysthymic disorder, and major depressive disorder. Personality disorders were found at a modest frequency and included pervasive developmental disorders, dissociative disorders, schizophrenia, and mental retardation. Low prevalence of factitious disorder/malingering, dementia, substance-related disorders, anxiety disorders, adjustment disorder, and eating disorders was found. The highest relative frequency in fibromyalgia patients was found to be somatoform disorder, followed by dysthymic disorder, major depressive disorder, and personality disorder (Table 4).

A diagnosis of somatoform disorders in the DSM-IV-TR psychiatric diagnosis was the most common one, and presented at a diagnostic rate of 69.4% of patients who reported chronic pain and who had received a diagnosis of psychiatric disorder. With respect to co-occurrence of somatoform disorder with other psychodiagnostic outcomes, it occurred at 89% among dissociative disorder patients, 88% with patients showing substance disorders, and 71% with patients exhibiting dysthymic disorders. Our results indicate that many

TABLE 3 The number of DSM-IV-TR psychiatric diagnoses

Number of psychodiagnostics				
Zero	1	2	3	More than 3
17 pts (4.9%)	211 pts (60.8%)	94 pts (27.1%)	17 pts (4.9%)	8 pts (2.3%)

TABLE 4 Psychodiagnostics with somatoform disorder co-occurrence in all 330 chronic pain patients and 130 fibromyalgia patients

Rank	Diagnosis	All patients (%)	Co-occurrence with somatoform disorder in all patients (%)	Fibromyalgia patients (%)
1	Somatoform disorder	69.4	100	76
2	Dysthymic disorder	14.8	71	17
3	Major depressive disorder	14.5	31	15
4	Personality disorder	11.8	59	12
5	Pervasive developmental disorder	7.3	42	8
6	Dissociative disorder	5.5	89	10
7	Schizophrenia	4.8	0	4
8	Mental retardation	4.5%	67	6
9	Factitious disorder, malingering	2.7	0	1
10	Dementia	2.7	44	2
11	Substance-related disorder	2.4	88	3
12	Anxiety disorder	1.8	50	0
13	Adjustment disorder	1.5	0	2
14	Eating disorder	0.9	67	2
	Others	1.5	40	0

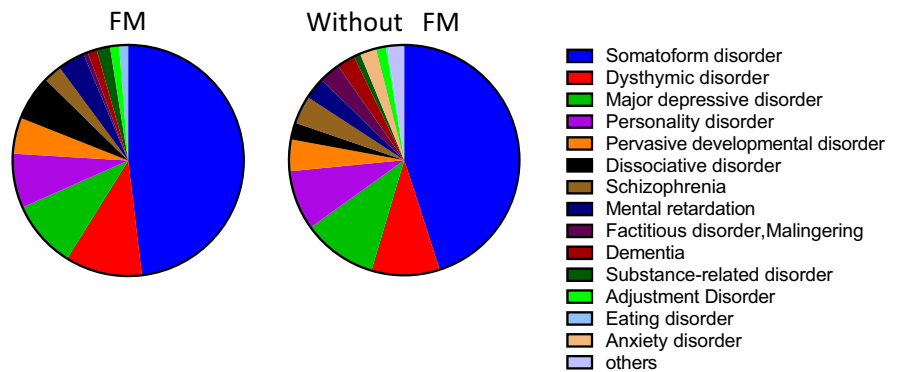


FIGURE 1 Psychodiagnoses of fibromyalgia patients and chronic pain patients without fibromyalgia

psychodiagnosed disorders are likely to co-occur with somatoform disorder. By contrast, schizophrenia had 0% co-occurrence with somatoform disorders (Table 4).

The profile of distribution of psychodiagnoses remained largely identical between chronic pain patients with and without fibromyalgia (Figure 1). However, dissociative disorder was significantly higher in patients who had chronic pain and fibromyalgia compared to those without fibromyalgia (10% vs 3.4%, $P < 0.005$) (Figure 1).

In summary, our results show that somatoform pain disorder is present at appreciably high rates among all chronic pain patients and among patients with fibromyalgia alone. It co-occurred with many other psychodiagnosed disorders (Table 4).

4 | DISCUSSION

Our results indicate that it is extremely likely that a psychiatric disorder may be diagnosed in for chronic pain patients, including fibromyalgia patients. In general practice, a mental health specialist is not involved in the diagnostic process of chronic pain patients. In our opinion, chronic pain patients with psychiatric disorders are very unlikely to consult a psychiatrist. Nevertheless, chronic pain patients are known to experience depression, anxiety, and mood disorder.¹⁴ The DSM has recently undergone a new revision. Therefore, although we used the DSM-IV TR to diagnose the patients in our study, we refer to the DSM-5 in this discussion.

In our testing protocol, a mental health specialist made a diagnosis before physician; thus, the possibility of a patient forgoing psychiatric examination after receiving a physician's diagnosis and treatment was low. However, under normal circumstances, patients are unlikely to receive appropriate psychiatric care even in cases where a psychiatric examination has been recommended. Often, once a physician has initiated diagnosis and treatment, a patient does not accept a psychiatric examination even when a psychiatric disorder is found. To address that problem, multidisciplinary pain centers are being established in Europe and the United States, but Japan lacks such facilities.¹⁵

Results of this study demonstrate that the rate of co-occurrence of psychiatric disorders in chronic pain patients, including those with fibromyalgia, is extremely high: 95%. Our facility is specialized to treat intractable chronic pain. Therefore, only medically unexplained

pain of patients who exhibit no physical disorder is treated, and even then, only after referral of the patient by another medical institution.

However, for patients with the chief complaint of pain who are being examined under any medical specialty other than mental health, it would be difficult for a doctor with no training in psychiatric medicine to make an appropriate diagnosis of a mental disorder. Among the patients with chronic pain, patients under psychiatric care or with a history of psychiatric care constituted the majority. Based on the fact that users of psychotropic drugs were in majority, the psychodiagnosis of patients complaining of chronic pain is important.

Furthermore, treating symptoms by prescribing antidepressants, anti-anxiety drugs, or anti-psychotic drug before a diagnosis has been made not only renders treatment of the condition invalid, it can also be dangerous, or give rise to iatrogenic illness. Proper diagnosis and treatment can improve patient outcomes.^{16–18}

Patients with depression are known to have pain that impairs activities of daily life.¹⁹ The presence of physical pain among depression patients in Japan appears to be associated with severe depression, treatment resistance, decreased health outcomes, greater use of healthcare resources, and lower productivity.²⁰

Anxiety disorder was diagnosed in 41.6% of fibromyalgia patients.²¹ However, our results do not indicate that patients with fibromyalgia have anxiety disorder. Our report is based on interviews and may differ from results obtained by the questionnaire method. Alternatively, differences might exist between Japanese and United States residents. A recent report of a study conducted using the Mini-International Neuropsychiatric Interview suggests that chronic lumbar pain patients have many major depressive episodes and dysthymic disorder.²² Fibromyalgia patients reported frequent history of childhood abuse, which is also concomitant with somatoform disorder and mood disorder.²³ Childhood abuse or trauma can also engender development of dissociative disorders.²⁴ Our study shows that 10% of fibromyalgia patients have dissociative disorders; also, 89% of dissociative disorder patients have co-occurrence with somatoform disorder. Moreover, 3.4% chronic pain patients without fibromyalgia have dissociative disorder. At the same time, the presence and the diagnosis of fibromyalgia or chronic pain patients can engender the development of dissociation.²⁵ If the presence of dissociation is a result of a history of childhood abuse, as chronic pain might be, then the presence of chronic pain can exacerbate the development of dissociation.



It is expected that a doctor outside of the medical specialty will have difficulty making a specialist determination on this type of high-risk case. For that reason, a psychiatric consultation should be conducted at earliest when a mental disorder is suspected. In other words, in light of the co-occurrence of physical disorder and mental disorder, a doctor who specializes in physical disorders and a doctor who specializes in mental disorders should collaborate on patient treatment. Nevertheless, patients complaining of pain firmly believe that their pain is a physical problem and not a mental disorder. Many have been unsuccessful in treating their pain based on that mistaken assumption, even after consultation with numerous doctors. As a result, patients often eventually develop a strong distrust for physicians. For such patients, a psychotherapeutic approach must often be applied to the very act of having them receive a psychiatric examination. Such an approach would be difficult for a doctor who does not specialize in mental health. At our chronic pain outpatient initial examination, about 57% of patients have already had a psychiatric consultation. We believe it is important for a psychiatrist and a physician to work together when treating pain, to reach a diagnosis and make decisions on appropriate treatments. In our study at the time of the initial examination, about 57% of all chronic pain patients were taking psychotropic drugs, 30% of fibromyalgia patients were under psychiatric care, and 30% had a history of psychiatric care. In addition, 57% of fibromyalgia patients had drug therapy with psychotropic drugs.

Psychiatric disorder was found in 97% of fibromyalgia patients. The average number of psychodiagnoses was 1.5, which is significantly higher than that in chronic pain patients without fibromyalgia.

Anxiety, depression, and catastrophizing beliefs about pain are associated with chronic pain and with a poor prognosis in people with various pain conditions.²⁶⁻²⁸

Pain and mental illness share a very close relationship. Somatization disorder is a history of somatic complaints over several years, starting before age 30. Such symptoms cannot be explained fully by a general medical condition or substance use. Alternatively, when an associated medical condition exists, the impairments attributable to the somatic symptoms are more severe than generally expected. Complaints are not feigned as in malingering or factitious disorder. The symptoms do not all occur concurrently but might occur over the course of the disorder. A somatoform disorder itself is chronic but fluctuating. It rarely remits completely. A thorough physical examination of the specified areas of complaint is important for the diagnosis of somatization disorder. Medical examinations would provide objective evidence of the subjective complaints of the individual. Somatoform disorder, a form of mental illness, causes one or more bodily symptoms, including pain. The symptoms might or might not be traceable to a physical cause including a general medical condition, other mental illness, or substance abuse. However, whichever is the case, they cause excessive and disproportionate levels of distress. The symptoms can involve one or more different organs and body systems such as pain, neurologic problems, gastrointestinal complaints, and sexual symptoms. Many people who have somatoform disorder will also have an anxiety disorder. Furthermore, the

distress from symptoms strongly affects daily functioning. Doctors must perform many tests to rule out other possible causes before diagnosing somatoform disorder. The diagnosis of somatoform disorder can cause great stress and frustration for patients, who might feel unsatisfied if no better physical explanation for their symptoms exists, or if they are told that their level of distress related to a physical illness is excessive. Stress often leads patients to worry more about their health, which creates a vicious cycle that can persist for years. Because a physician who diagnosis and treats physical disorders has difficulty diagnosing somatoform disorders, the assistance of a mental health specialist is necessary.

Results suggest that there is a risk of exacerbating the psychiatric disorder or causing iatrogenic impairment by proceeding with treatment without recognizing the existence of a psychiatric disorder. In 12% of chronic pain patients and fibromyalgia patients, priority is assigned to the treatment of the personality disorder as a first principle. Based on diagnostic standards, no co-occurrence of adjustment disorder exists, but as a treatment policy it is treated as identical to somatic symptom disorder. Factitious disorder and malingering are present in 3% of all chronic pain patients and in 1% of fibromyalgia patients, and both disorders will progress unless a correct diagnosis of somatoform disorder is made. For this reason, as well, we believe that involvement by a mental health specialist and a physician is necessary.

Substance-related disorders were found in about 2.4% of chronic pain patients and in 3% of fibromyalgia patients. Because many instances of substance-related disorder are likely, although not yet diagnosable, it is important to avoid treating somatic symptom disorders by prescribing dependence-inducing drugs inappropriately. In addition, particular care must be exercised in this area because most chronic pain patients (56.8%) are taking psychotropic drugs.

Pervasive developmental disorder and mental retardation were found together in 12%-14% of the patients examined in this study. These mental disorders are thought to be underlying conditions. Although neither is treatable, societal support is necessary. Although mental retardation is apparent from early childhood, often high-functioning pervasive developmental disorder will not be clear until adulthood. Therefore, more careful clinical psychiatric involvement is necessary.

Dementia was found in 2%-3% of patients in this study. Schizophrenia was found in 5% among fibromyalgia patients and 4% in chronic pain patients. Pain improves by treating schizophrenia before the pain is treated. Therefore, a diagnosis of schizophrenia is crucially important. Patients with chronic headache and fibromyalgia showed high scores on hypochondriasis, depression, hysteria, paranoia, psychasthenia, and schizophrenia (MMPI-2) and more somatization, obsession, and anxiety.²⁹ This study found the percentage of schizophrenia associated with chronic pain as 4%-5%. Non-psychiatric physicians should not start treatment of the chronic pain without first knowing if the patient has schizophrenia. Interview reports of fibromyalgia patients from Turkey show that histrionic personality disorder is more common in fibromyalgia patients than among controls, but schizophrenia is not.³⁰ However, that Turkish study was a



limited survey only of patients who received no psychotropic drug, whereas half of the patients we surveyed had already received psychotropic drugs. The patients who receive the psychotropic drugs may have more psychiatric symptoms than the patients without the psychiatric drugs. We found schizophrenia patients among chronic pain patients. No report of the relevant literature describes comorbidities of schizophrenia and fibromyalgia. However, to find cases of schizophrenia, psychiatrists who are familiar with pain treatment should perform psychiatric diagnosis using face-to-face interviews prior to a physical examination.

Major depressive disorder is high among both chronic pain patients as a whole and among fibromyalgia patients as well. Treatment of major depressive disorder takes priority. Nevertheless, care must be taken because this disorder is often misdiagnosed. One study has evaluated the relation between pain and distress, analyzing possible risk and exacerbating factors such as alexithymia.³¹ Dysthymic disorder was diagnosed in 15% of all chronic pain patients and in 17% of fibromyalgia patients. In cases of co-occurrence with personality disorder, treatment that prioritizes the personality disorder is important. When no co-occurrence is found, treatment in line with a major depressive disorder is crucially important.

As described above, many mental disorders share comorbidity with chronic pain and fibromyalgia. In our investigation described herein, psychiatric diagnosis was conducted by a psychiatrist who is familiar with pain treatment. Many previous studies using questionnaires did not involve psychiatrists. Depression, anxiety, mood disorders, and somatoform disorder were reported previously. By contrast, we emphasize the comorbidities of schizophrenia in our research. Future reports will present those results.

5 | LIMITATIONS

Antidepressant drugs exhibit analgesic effects in addition to antidepressant effects. The group of patients that we studied included some who had already been taking antidepressants before being diagnosed by a mental health specialist. Therefore, the possibility exists that precise psychiatric diagnosis and pain assessment were not achieved. Five percent of the patients opted out of the three mental health examinations. Therefore, only 95% of patients received a diagnosis by a mental health specialist. Psychiatric diagnosis was performed by single psychiatrist, and we could not validate these diagnoses by another psychiatrist. Our chronic pain clinic is based on hospital specializing in rheumatology and orthopedic surgery, and selection bias must be considered.

6 | SUMMARY

Co-occurrence of mental disorders was found in fibromyalgia and other chronic pain conditions. Having the mental disorder diagnosed by a mental health specialist in advance can support more effective

pain treatment of patients by physicians. It may be challenging for general physicians in Japan to diagnose a mental disorder. Therefore, it is important to have an appropriate diagnosis that is reached by a mental health specialist before a patient is examined by a physician, as we do at our clinic. Once mental health specialists conduct precise diagnoses, effective treatments by physicians in Japan may be administered, thereby reducing the risk of careless prescription of opioids and antidepressants to patients with co-occurring psychiatric disorders.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA REPOSITORY

The entirety of the patient's data cannot be made publicly available as data sharing was not included in the consent.

APPROVAL OF THE RESEARCH PROTOCOL BY AN INSTITUTIONAL REVIEWER BOARD

The study protocol was approved by the Ethic Committee of Amagasaki Central Hospital.

INFORMED CONSENT

Patients who met the inclusion criteria were enrolled in the study after providing verbal consent.

REGISTRY AND THE REGISTRATION NO. OF THE STUDY/TRIAL

n/a.

ANIMAL STUDIES

n/a.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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