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Pain, Sensitization, Fatigue, and Functional Impairment

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Abstract

This article distinguishes the observations denoted by pain, fatigue, sensitization, functional impairment, and post-activity worsening in discussions of fibromyalgia. The 2016 criteria structure painful sites, spatial distribution, and fatigue over the previous week, while the FIQR distinguishes difficulty with activities and overall impact over the past seven days from its symptom items. QST observes protocol-dependent psychophysical responses to controlled stimuli; it is not a sole mechanism, an individual diagnosis, or a test of whether pain is genuine. Because the current evidence does not align activity and symptoms on one time axis, it does not establish the onset, magnitude, duration, recovery, causal direction, or universality of post-activity worsening. Observations recorded together may be related, but they are neither identical nor causally ordered by that fact.

Keywords: fibromyalgia pain · fibromyalgia sensitization · fibromyalgia fatigue · fibromyalgia functional impairment · post-activity worsening · Widespread Pain Index · WPI · Symptom Severity Scale · SSS · quantitative sensory testing · QST · FIQR

1. Before Placing Five Terms on One Line

Criteria and questionnaires used in fibromyalgia bring together several symptoms and effects. Recording them together shows that their co-occurrence matters clinically, but it does not mean that each item is a different name for the same phenomenon. ^[1, 2]

Pain can be recorded as the sites that hurt over the previous week and their spatial distribution, while fatigue is recorded as the severity of a symptom experienced over the same period. Function is assessed by asking how difficult particular activities were and how much fibromyalgia affected the week as a whole. Sensitization research observes responses to controlled stimuli. ^[1, 2, 3]

The first question for distinguishing these terms is therefore, “What was observed?” The observation window and the instrument come next. Combining different observations into one score or one explanation adds an order and a cause that the data do not establish. ^[1, 2, 3]

Table 1. The Observations Denoted by Five Terms and the Boundaries of Interpretation

Term	Observation denoted in this article	Instrument or evidence status	Time window or test context	What may overlap but is not identical	What this observation alone cannot establish
Pain	The number of areas that were painful during the previous week and the spatial-distribution condition asking whether pain was present in at least four of five body regions	The 0–19 Widespread Pain Index (WPI) in the 2016 criteria and a separate generalized-pain condition ^[1]	The previous week. Jaw, chest, and abdominal pain are excluded from the generalized-pain distribution calculation	It may be recorded alongside fatigue in the criteria but is a different observation from fatigue, sensitization, and functional impairment	Pain intensity, pain mechanism, fatigue, sensitization, or functional impairment
Fatigue	The severity of fatigue separately rated by the patient over the previous week	The 0–3 fatigue item in the Symptom Severity Scale (SSS). Waking unrefreshed and cognitive symptoms are separate items ^[1]	Self-report over the previous week	It is recorded alongside pain in the criteria but is not the same as waking unrefreshed, sleep state, or functional impairment. Nor is it interchangeable with energy, the label of an FIQR item ^[1,2]	Sleep state, functional impairment, or a biological cause
Sensitization	Psychophysical responses evoked by mechanical or thermal stimuli at controlled intensities, and the bounded inference drawn from those responses	Quantitative sensory testing (QST). Test sites and types, stimulus parameters, equipment, and interpretive definitions are heterogeneous and not fully standardized ^[3]	The context of the test occasion and specified protocol. The peripheral nervous system also contributes to interpreting temporal summation and conditioned pain modulation, and each study must define its parameters	A laboratory-evoked response distinct from spontaneously reported pain and fatigue and from functional impairment over the past seven days	A sole mechanism, an individual diagnosis, a verdict on whether pain is genuine, or a universal sensitization pattern
Functional impairment	Self-reported difficulty performing specified activities over the past seven days and the impact on the week as a whole	The function and overall-impact domains of the Revised Fibromyalgia Impact Questionnaire (FIQR). Its 21 items are rated from 0 to 10 ^[2]	A summary of the past seven days. It does not track within-day change or change immediately after activity	The same FIQR includes symptom items for pain, energy, and sleep, but these are separate from difficulty with activities and overall impact	Overall disease severity, etiology, or temporal order within a day
Post-activity worsening	An explicit evidence gap in a temporal relation that was not directly observed in the material reviewed here	No data align activity and symptoms over time within individuals ^[1,2,3]	Not established: activity dose, pre-activity state, onset, magnitude of change, duration, recovery, or universality	It cannot be said to have been recorded alongside the other four terms. The absence of temporal evidence is not evidence that no relation exists	Time of onset, magnitude of change, duration, recovery pattern, causal direction, or whether the pattern is the same for everyone

Note. This table supplements rather than replaces the article's linear explanation. The five rows should not be compared as one quantitative scale or an ordered ranking of severity.

2. Pain: Reported Sites and Spatial Distribution

In the 2016 criteria, the Widespread Pain Index (WPI) records the number of areas that were painful during the previous week on a scale from 0 to 19. It is a self-reported count of painful sites, not a direct measure of pain intensity or cause. ^[1]

Separate from the number of sites, the same criteria ask whether pain is present in at least four of five body regions. This “generalized pain” condition is intended to distinguish how pain is distributed spatially. Pain in the jaw, chest, and abdomen is not included in this regional distribution calculation. ^[1]

Even within the word “pain,” the number of sites and spatial distribution are distinct. Both structure a patient's report of pain, but neither substitutes for measuring a sensitization mechanism, the severity of fatigue, or difficulty performing activities. ^[1,2,3]

3. Fatigue: A Symptom Report Distinct Even from Waking Unrefreshed

The 2016 Symptom Severity Scale (SSS) rates fatigue, waking unrefreshed, and cognitive symptoms separately according to their severity over the previous week. Each of the three items is scored from 0 to 3 before the scores are summed. ^[1]

The inclusion of fatigue and waking unrefreshed in the same scale means that both experiences matter. Their structure as separate items, however, shows that the terms are not interchangeable. A fatigue score alone cannot establish the state of a person's sleep. ^[1]

The FIQR likewise uses separate symptom items for pain, energy, and sleep quality. Here, energy is the label of an FIQR item, while fatigue is the symptom separately rated in the 2016 criteria. The two expressions should not be substituted as though they were the same item, and neither is the same observation as pain distribution, responses to stimuli, or difficulty with activities. ^[1, 2]

4. Sensitization: Reading Responses to Controlled Stimuli

Quantitative sensory testing (QST) applies mechanical or thermal stimuli at controlled intensities and measures the responses. What is observed is a psychophysical stimulus-response evoked under specific test conditions. The setting of observation already differs from a report of pain that arises spontaneously in daily life. ^[3]

A 2025 scoping review screened 2,512 records and included 126 studies, but found inconsistency in test sites and types, stimulus intensity and duration, rest intervals, equipment, and interpretive definitions. This is why results from different protocols are difficult to read as one universal sensitization value. ^[3]

Temporal summation and conditioned pain modulation are frequently used to study central sensitization, but the review noted that the peripheral nervous system is also involved and that each study must define the parameters used to analyze sensitization. In this article, sensitization is a bounded observation and inference based on evoked responses—not a sole mechanism, an individual diagnosis, or a test of whether pain is genuine. ^[3]

5. Functional Impairment: Difficulty with Activities and Overall Impact over the Past Seven Days

The FIQR rates all 21 items from 0 to 10 and groups them into three domains: function, overall impact, and symptoms. Every item refers to the past seven days. This structure differs from a test of ability at the present moment or a direct record of change within a day. ^[2]

The function domain asks how difficult fibromyalgia made specified activities during the past seven days. The overall-impact domain separately asks about accomplishing goals for the week and the degree to which symptoms were overwhelming. In this article, functional impairment refers to these self-reports of difficulty with activities and overall impact. ^[2]

Even within the FIQR, pain, energy, and sleep are symptom items, while difficulty with activities and overall impact belong to other domains. The fact that they can be combined into a total score does not make functional impairment equivalent to overall disease severity or another name for pain or fatigue.^[2]

6. Where Is Overlap Observed?

The first overlap appears when several items are recorded within the same criteria or questionnaire. The WPI and SSS address pain sites and fatigue together, while the FIQR records function and overall impact alongside distinct items for pain, energy, and sleep.^[1, 2]

The second overlap is that different measurements are used to describe the same person or group. Reported pain and fatigue, difficulty with activities over the past seven days, and laboratory-evoked responses can illuminate different aspects of one person's state.^[1, 2, 3]

Co-recording, however, is neither identity nor causality. It does not follow that pain proves sensitization or that fatigue is functional impairment. Given the protocol heterogeneity in QST, group-level evoked responses should also not be transferred to an individual as a fixed explanation.^[1, 2, 3]

7. Post-Activity Worsening: The Missing Time Axis

The criteria, FIQR, and QST review examined here do not align activity level and pre-activity state on a time axis and then trace symptom onset, magnitude of change, duration, and recovery within individuals.^[1, 2, 3]

This evidence scope therefore cannot determine when post-activity worsening begins, how long it lasts, how recovery unfolds, or whether everyone experiences the same pattern. Difficulty with activities over the previous seven days on the FIQR cannot be reinterpreted as a record of change immediately after activity.^[2]

This gap is not evidence that no relation exists. It means only that there is no basis here for filling in a universal sequence or duration. Post-activity worsening must remain an explicit evidence gap in this terminology map.^[1, 2, 3]

8. Reading Together Without Merging

Pain can be read as reported sites and distribution; fatigue as reported symptom severity; sensitization as a bounded inference from responses to controlled stimuli; and functional impairment as difficulty with activities and overall impact over the past seven days. For post-activity worsening, the material reviewed here leaves the time axis unfilled.^[1, 2, 3]

This distinction is not meant to fragment experience. Naming different observations precisely helps prevent one measurement from erasing another experience. A test result within the expected range, or one that differs from expectations, should not be used to invalidate reports of pain, fatigue, or

function. ^[1, 2, 3]

The conclusion is that these observations may be related, but they are not the same. If future research asks how they are related, it should repeatedly measure activity, pain, fatigue, sleep, and function on the same time axis and specify the QST conditions. This is not a finding of the current evidence; it is a research question derived from the observational differences and temporal gap identified here. ^[1, 2, 3]

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Ethics	Only public literature was used; no individual patient data or clinical intervention was involved. Any future human-participant research requires separate ethics review before it begins.

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