

Maladaptive Perfectionism and the Impact of Fibromyalgia: A Serial Mediation Model Through Sleep Reactivity, Insomnia Severity, and Pain Catastrophizing

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1. Round 1

1.1. Reviewer 1

Reviewer:

The final sentence of the Introduction identifies the aim as examining “the serial mediating roles of sleep reactivity, insomnia severity, and pain catastrophizing,” but the manuscript does not present explicit hypotheses. The authors should add clearly formulated hypotheses immediately before the study aim. At minimum, separate hypotheses should address the positive associations between maladaptive perfectionism and each mediator, the association of each mediator with fibromyalgia impact, the complete three-mediator serial indirect effect, and the anticipated persistence or disappearance of the direct effect. Stating hypotheses prospectively would improve methodological transparency and prevent the analytical model from appearing to have been selected after examining the observed correlations.

In the Study Design and Participants section, the manuscript describes the study as “a cross-sectional, descriptive-correlational design” and later interprets the model as a sequence through which maladaptive perfectionism “increased vulnerability to stress-related sleep disturbance.” Cross-sectional mediation cannot demonstrate temporal precedence,

developmental sequence, or causal transmission. The language throughout the Methods, Findings, Discussion, Abstract, and Figure should therefore be revised to avoid causal verbs such as “increased,” “contributed to,” “intensified,” and “translated into.” More accurate phrasing would describe statistically compatible indirect associations. The authors should also state that PROCESS Model 6 estimates a hypothesized ordering among contemporaneously measured variables and does not establish that changes in the predictor occurred before changes in the mediators or outcome.

The manuscript reports that “a total of 368 individuals initially accessed the online survey” and that exclusions resulted in “exactly 300 adults with fibromyalgia.” The participant flow requires more transparent reporting. The authors should specify how many individuals were recruited from each source, how duplicate entries were prevented, how Canadian residency was verified, how many participants were excluded for each clinical criterion, and what constituted “substantially incomplete questionnaires” or “insufficient engagement.” A participant-flow diagram would be preferable, even if the journal does not require a CONSORT-style figure. The phrase “exactly 300” should also be replaced with neutral reporting unless 300 was a preregistered recruitment target, in which case the target and stopping rule should be explicitly stated.

The Methods state that participants were required to have “received a diagnosis of fibromyalgia from a physician or qualified healthcare professional,” yet the Discussion acknowledges that diagnoses were based primarily on self-report. This is a major issue because the validity of the outcome model depends on accurate case identification. The authors should explain whether participants were asked to identify the diagnosing professional, year of diagnosis, diagnostic criteria used, or clinic where the diagnosis was made. If medical-record confirmation was not obtained, the manuscript should consistently describe the diagnosis as self-reported clinician-diagnosed fibromyalgia. The authors should also clarify whether participants met current symptom-based diagnostic criteria at the time of participation, since a historical diagnosis alone may not adequately characterize the present sample.

The exclusion criteria include “untreated sleep apnea” and several psychiatric and neurological conditions, but the manuscript does not explain how these conditions were screened. This is particularly important because sleep apnea, restless legs syndrome, medication effects, major depressive episodes, and other sleep disorders could substantially influence Insomnia Severity Index scores and the relationship between sleep reactivity and fibromyalgia impact. The authors should describe the screening questions, whether validated screening instruments were used, and whether treated sleep apnea was permitted. The rationale for excluding acute mania and psychosis while retaining highly prevalent depression and anxiety should also be stated. A sensitivity analysis adjusting for depressive and anxiety disorders would be valuable because these conditions are likely common causes of both perfectionistic distress and insomnia.

The manuscript indicates that “the principal questionnaires were presented in a randomized sequence,” but no information is provided regarding how randomization was implemented or whether the demographic form and pain-intensity item always appeared first. The authors should specify whether true questionnaire-order randomization or block randomization was used, whether all participants completed the same item order within each instrument, and whether the survey platform recorded completion time and interruptions. Because the total battery contains numerous emotionally and physically demanding items, the authors should also report whether participants were permitted to pause and return and whether partially completed sessions were treated as separate entries.

The use of ordinary least-squares PROCESS analysis should be justified in relation to measurement error and model complexity. The manuscript reports that the model included one predictor, three mediators, an outcome, and five covariates, yet all constructs were treated as perfectly measured observed scores. Given the high conceptual overlap among insomnia severity, pain catastrophizing, and fibromyalgia impact, structural equation modeling with latent variables would have provided stronger control for measurement error and allowed formal assessment of overall model fit. At minimum, the authors should report why PROCESS was selected, present all equations and covariate coefficients in supplementary material, and acknowledge that PROCESS does not provide global fit indices for evaluating whether the hypothesized model is superior to alternative models.

Table 1 reports a correlation of $r = .699$ between pain catastrophizing and fibromyalgia impact, and the final regression model explains 69.6% of the variance in fibromyalgia impact. These are large associations that warrant examination for construct overlap and common-method inflation. Several FIQR items assess pain severity, distress, anxiety, and functional interference, while the Pain Catastrophizing Scale assesses highly related cognitive-emotional responses to pain. The authors should test discriminant validity, inspect item-level redundancy, and consider whether the strength of the final model is partly

attributable to overlapping self-report content. Reporting heterotrait–monotrait ratios or latent correlations would help demonstrate that the constructs remain empirically distinguishable.

Authors revised the manuscript and uploaded the document.

1.2. Reviewer 2

Reviewer:

The ethical statement is incomplete. The Methods merely state that the study “received approval from the responsible institutional research ethics board in Canada.” The authors must provide the full name of the approving institution, the research ethics board, the approval or protocol number, and the approval date. They should also clarify whether compensation was provided, how participants were informed about potential distress, and whether referral information was available for participants reporting severe insomnia, emotional distress, or overwhelming pain. Because the sample was recruited across multiple provinces and possibly through clinical sites, the authors should state whether additional site-specific approvals or data-sharing agreements were required.

The choice of the Discrepancy subscale of the Almost Perfect Scale–Revised as the sole measure of maladaptive perfectionism requires stronger justification. The manuscript states that it “reflects persistent perceptions of failure, dissatisfaction with performance, excessive self-criticism, and the belief that personal achievements do not meet one’s own expectations.” However, discrepancy is only one component of maladaptive perfectionism and does not directly assess concern over mistakes, doubts about actions, socially prescribed perfectionism, or perfectionistic self-presentation. The authors should clarify why this subscale was preferred to a broader multidimensional instrument and whether its factor structure and validity have been established among adults with chronic pain. The term “maladaptive perfectionism” should not be used interchangeably with “discrepancy” without acknowledging this operational limitation.

The Data Collection Tools section provides general descriptions of the questionnaires but does not sufficiently document the versions used. For each instrument, the authors should report the original citation, number of response options, scoring procedure, interpretation of higher scores, evidence of validity in fibromyalgia or chronic pain populations, and whether an English or French version was administered. The statement that participants needed to “read and understand English” has important implications in a Canadian study, especially given the reported recruitment of participants from Quebec. The authors should discuss the exclusion of French-speaking adults and explain whether any linguistic or cultural adaptation was undertaken.

The manuscript reports very high internal consistency coefficients for all measures, for example “Cronbach’s alpha coefficients ranging from .88 to .94 and McDonald’s omega coefficients ranging from .89 to .94.” Reliability alone does not demonstrate construct validity. The authors should report confirmatory factor analyses or, at minimum, provide evidence that the intended dimensional structure was plausible in the present sample. This is particularly important for the Revised Fibromyalgia Impact Questionnaire, which includes heterogeneous symptom, functioning, and overall-impact domains. The authors should clarify whether a total score was psychometrically defensible in this sample and whether the three FIQR domains yielded different relationships with the mediators. Supplementary analyses using physical functioning, overall impact, and symptom severity as separate outcomes would substantially improve the clinical interpretability of the findings.

The missing-data procedure requires revision. The Data Analysis section states that “participant-level mean substitution within the relevant scale was used” when missingness was minimal. Person-mean substitution can attenuate variance, inflate reliability, and bias correlations and regression coefficients, particularly in mediation analysis. The authors should report the number of participants and items affected, evaluate the missing-data mechanism, and consider multiple imputation or full-information maximum likelihood instead. If the amount of missingness was truly negligible, complete-case analysis may be more transparent than deterministic substitution. The manuscript should also clarify whether the stated 0.62% item-level missingness was calculated before or after excluding incomplete cases.

The selection of covariates is not adequately justified. The Methods state that “age, sex, duration of fibromyalgia, average pain intensity, and current use of sleep medication were retained as covariates because they could affect sleep disturbance,

pain-related cognition, and functional impairment.” Covariates should be selected using a prespecified causal rationale rather than because they are statistically associated with the outcome. The authors should provide a directed conceptual justification for each covariate, explain why education, employment or disability status, antidepressant use, anxiety or depression, and rehabilitation participation were excluded, and discuss whether controlling for pain intensity may constitute overadjustment because pain intensity is conceptually embedded within fibromyalgia impact and may lie on the same causal pathway as pain catastrophizing.

Authors revised the manuscript and uploaded the document.

2. Revised

Editor’s decision: Accepted.

Editor in Chief’s decision: Accepted.