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Pain Severity and Depressive Symptoms in Endometriosis Patients: Mediation of Negative Body Awareness and Interoceptive Self-Regulation

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Abstract: **Endometriosis-related pain may be associated with depressive symptoms. Although a growing body of evidence supports this association, the underlying mechanisms are still largely unclear. Impaired perceptions of bodily external and internal stimuli may be involved in this process. This study aims to assess the mediating role of 2 facets of interoception—the awareness of negative body signals and interoceptive self-regulation—in the association between pain severity and depressive symptoms among women with endometriosis. A total of 301 patients who reported a diagnosis of endometriosis were recruited from an endometriosis and chronic pelvic pain outpatient university clinic and through patient associations and completed self-reported instruments. A parallel mediation analysis was conducted. Almost half of women (48.2%) reported depressive symptoms above the self-rating scale cutoff values. Pain severity significantly predicted depressive symptoms (β = .39, 95% bootstrap confidence interval [CI] [.719, 1.333]). Negative body awareness (β = .121, 95% bootstrap CI [.174, .468]) and interoceptive self-regulation (β = .05, 95% bootstrap CI [.035, .252]) partially mediated this relationship. Our findings indicated that pain may interfere with the perception of the body as a source of calmness and safety, limiting the individual's ability to effectively regulate emotions. Future research should further explore these mechanisms and evaluate the efficacy of interventions focusing on interoceptive sensibility to enhance the psychological well-being of endometriosis patients.**

Perspective: ***This article investigates for the first time the potential role of 2 facets of interoceptive sensibility in the relationship between pain severity and depressive symptoms in women with endometriosis. These findings may contribute to advancing knowledge about the mechanisms involved in the complex pain-depression cycle.***

Key words: *Endometriosis, chronic pelvic pain, body awareness, depression, interoception*

Endometriosis is a chronic inflammatory estrogen-dependent disease characterized by endometrium-like tissue outside the uterus,[1,2] which affects between 2 and 10% of women of reproductive age, and up to 50% of women with chronic pelvic pain (CPP) or infertility.[3,4] The most frequent symptom of endometriosis is CPP,[5] described as persistent or recurrent pain in the lower abdomen or pelvis lasting for at least 6 months,[6,7] encompassing both cyclical (ie, dysmenorrhea) and noncyclical pelvic pain experiences.[6,8-10]

Endometriosis-related pain symptoms are not always directly related to the disease's extent and location and tend to return after treatments even without lesion recurrences.[1,11,12] Moreover, the nonspecific presentation of symptoms often delays the diagnosis,[13] worsening the impact on quality of life and mental health.[14-16]

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Following the biopsychosocial model,[17-19] pain is viewed as a subjective experience resulting from the interaction among biological, psychological, and social factors.[20] Unlike acute pain, which serves as a protective warning and typically resolves shortly after tissue injury, chronic pain involves complex pathophysiological mechanisms that may produce or exacerbate pain, leading to chronic pain syndrome. These processes include neuroplasticity, visceral hypersensitivity,[18,21] and alterations in pain-related sensory pathways in the peripheral and central nervous system, namely central sensitization,[22] often resulting in increased pain severity and reduced responsiveness to medications.[23]

Studies have found that endometriosis patients with severe CPP exhibit higher levels of depressive symptoms compared to those without pain, indicating a strong association between pain and psychological distress.[24-26] It has been proposed that both pain and depressive symptoms may stem from shared underlying factors, including sensitization processes,[7,27] Hypothalamic-pituitary-adrenal axis alterations,[28,29] augmented inflammatory processes,[30-32] and altered immunity.[33,34] However, pain improvement alone does not necessarily lead to a reduction in depressive symptoms,[35,36] suggesting a complex interplay with cognitive, emotional, and social factors in influencing pain experiences and psychological distress.[37,38] For instance, pain acceptance, psychological flexibility, self-efficacy, and social support have been positively associated with psychological well-being in chronic pain patients,[39-43] while catastrophizing was related to heightened pain and depressive symptoms.[44-46]

CPP can also affect patients' body perception,[47] impairing the processing of bodily external and internal stimuli.[48-50] Interoceptive sensibility refers to the subjective perception of visceral afferent information (ie, heart, lung, and stomach) and the ability to accurately perceive it.[51,52] In other populations, altered interoceptive sensibility has been associated with both increased pain severity[51,53,54] and depression.[55-57] In this vein, it may serve as a significant variable within the biopsychosocial framework, further explaining the chronic pain impact on psychological distress. Interoceptive sensibility is usually measured by using self-report questionnaires like the Body Perception Questionnaire (BPQ)[58] and the Multidimensional Assessment of Interoceptive Awareness (MAIA),[59] involving different facets of this construct. In particular, the Awareness subscale of the BPQ provides a measure of the subjective experience of one's negative bodily signals. Higher scores on this scale are associated with somatosensory amplification,[48] higher pain intensity,[60] and increased levels of depressive symptoms.[61] The MAIA self-regulation subscale, instead, captures the ability to regulate emotions by focusing attention on body sensations.[62] Higher scores on this scale are related to enhanced pain tolerance,[63] less pain-catastrophizing,[64] and lower depressive symptoms.[65]

Although the influence of CPP severity on depression[37] and the associations between interoceptive sensibility and both pain and emotional well-being are well-known,[49,52,55] no studies investigated the role of interceptive sensibility in the CPP-depression relationship in endometriosis patients. We hypothesize that altered interoceptive sensibility (measured by negative body awareness and interoceptive self-regulation) will mediate the relationship between pain severity and depressive symptoms. In particular, we expect that pain severity will be positively associated with negative body awareness, which in turn will be associated with depressive symptoms. Moreover, pain severity will be negatively related to interoceptive self-regulation, which in turn will negatively predict depressive symptomatology.

Methods

Participants and Procedures

Participants included 301 women diagnosed with endometriosis, recruited at the Endometriosis and Chronic Pelvic Pain Outpatient Service of Policlinico Umberto I University Hospital of Rome and through social media thematic groups on endometriosis. Eligible patients were women who reported being diagnosed with endometriosis through gynecological examination, pelvic ultrasounds, magnetic resonance imaging, or surgery. Patients had to be over 18 years old and able to speak and understand fluently Italian. Exclusion criteria were current pregnancy and menopause.

All participants took part voluntarily in the study and were not remunerated. At the time of recruitment, women received information about the aims of the study and signed an informed consent. The study was approved by the Institution Review Board of the Psychology Department, Sapienza University of Rome (Prot. N. 0000800).

Measures

Sociodemographic Data and Clinical Information

Patients were asked to report sociodemographic information, including age, education, marital status, and occupation. Clinical data such as height, weight, age at symptom onset, age at diagnosis, previous surgery, type of hormonal therapy, characteristics of endometriosis (ovarian endometrioma and/or deep endometriosis), and menstrual characteristics (ie, characteristics of the menstrual cycles, presence of amenorrhea due to hormonal therapy) were also recorded. Additionally, participants were asked to provide data about endometriosis-related pelvic pain symptoms experienced over the previous 3 months. These symptoms included dysmenorrhea, dyspareunia, acyclic pelvic pain, dyschezia, and dysuria, which were rated on a 0 to 10 numerical rating scale (0 = "no pain," 10 = "the worst imaginable pain"). Consistent with previous clinical studies, values above 5 were considered indicative of the presence of moderate pain.[66,67]

Pain Severity

Pain severity was measured by using the Pain Severity subscale of the West Haven-Yale Multidimensional Pain

Inventory,[68,69] in line with previous studies on CPP patients.[70-72]

This subscale consists of 2 items regarding patients' perceptions of one's pain intensity: "*On average, how severe has your pain been during the last week?*" and "*How much suffering do you experience because of your pain?*". Responses to each question are scored on a 7-point rating scale ranging from 0 (No pain) to 6 (Extreme Pain) and averaged to produce an overall score, with higher scores reflecting greater pain severity.

Interoceptive Awareness

Body awareness of uncomfortable or threatening body signals. The Body Awareness domain of the Body Perception Questionnaire—Short Form (BPQ)[58,73] was used to assess the subjective experience of information arising from within the body. Items refer to sensations primarily linked to stress reactions in organs that are innervated by the autonomic nervous system. An example item is "*I feel my mouth is dry*" with responses evaluated on a 5-point Likert scale from 1 (Never) to 5 (Always). Higher scores correspond to higher levels of body-related sensations' awareness.

Interceptive Self-Regulation

The 4-item Self-Regulation Subscale of the MAIA[62,74] was used to evaluate the ability to regulate negative emotions by attention to body sensations. An example item is "*I can use my breath to reduce tension*," with responses scored on a 6-point Likert scale ranging from 0 (Never) to 5 (Always). Higher scores indicate higher interoceptive sensibility.

Depressive Symptoms

Depressive symptoms were captured through the Depression Subscale of the Hospital Anxiety and Depression Scale.[75,76] The questionnaire investigates the presence of depressive symptoms over the past week. An example item is "*I can laugh and see the funny side of things (reversed score)*" with responses scored on a 4-point Likert scale ranging from 0 to 3. Total scores range from 0 to 21, with higher scores representing more severe depressive symptoms. A cutoff score of ≥8 indicates clinically significant depressive symptoms.[77]

Statistical Analyses

Data analyses were conducted using IBM SPSS Statistic version 26 (SPSS Inc, Armonk, NY). The demographic, clinical, and psychological variables were described by their means (M) ± standard deviations or by the number of participants (N) with the percentage in parenthesis.

The distribution of continuous variables was investigated using descriptive statistics, considering skewness and kurtosis (values ranging between −1 and +1 were considered acceptable). Pearson correlations were conducted to examine the associations between study variables, and all results were reported as Pearson's *r* and *P* value.

A power analysis using Monte Carlo power analysis for indirect effects[78] indicates a minimum sample of 153 participants is required to detect medium effects (effect size = .30) with a power of .95 using a mediational model with parallel mediators (alpha = .05).

A parallel multiple-mediation path analysis model was used to examine whether body awareness and interoceptive self-regulation would mediate the relationship between pain severity and depressive symptoms. Parallel multiple-mediation path analysis allows testing multiple mediators simultaneously while accounting for any confounding variables controlled for as covariates.[79] Hayes'[79] PROCESS macro for SPSS was used to conduct the mediational path analyses through model 4, which provided bootstrapping confidence intervals (CIs), model estimations, and conditional and direct effect computations.[80] The method included 5,000 bootstrap samples for coefficient and indirect estimation and 95% bias-corrected CIs for the indirect effect. The hypothesized model was built with pain severity (Multidimensional Pain Inventory) as the independent variable, body awareness (BPQ) and interoceptive self-regulation (MAIA) as mediators, and depressive symptomatology (Hospital Anxiety and Depression Scale) as the dependent variable. Variables that significantly correlated with the predictor, the mediators, or the outcome were entered as covariates, as suggested by Meyvis and Van Osselaer.[81]

We reported the standardized effect size (β) and the 95% bias-corrected CI for the indirect effect model. The mediation effect is significant if the 95% CI does not include 0.

Results

Women's ages ranged from 18 to 51 years (mean 35.3 ± 7.6). Most women were employed (73.7%), had a high school diploma (40.9%), and were in a stable relationship (62.4%). The majority of women were Caucasian (98.3%) and only a few were from other ethnicities (1.7%). Overall, 73.7% of women were undergoing hormonal therapy and 50.7% were in amenorrhea due to progestin or continuous oral contraception treatments. Regarding the presence of endometriosis, 38.2% of women reported having ovarian endometrioma, 43.2% deep-infiltrating endometriosis, and 18.6% both ovarian and deep-infiltrating endometriosis lesions. A large proportion of women (51.8%) had undergone previous surgery. The mean diagnostic delay was 10.2 (standard deviation 8.3). Out of 301 patients, 48.2% exceeded the cutoff for depression on the self-report questionnaire. Sociodemographic and clinical characteristics are reported in detail in Tables 1 and 2.

Table 3 reports the bivariate correlations among the variables of interest. The results showed that pain severity was positively correlated with diagnostic delay (r = .17, *P* = .004), Body Mass Index (r = .17, *P* = .004), depression (r = .37, *P* < .001), and body awareness (r = .38, *P* < .001), and negatively correlated with education (r = −.12, *P* = .031), and interoceptive self-regulation (r = −.17, *P* = .003). Depressive symptomatology was positively

Table 1. Sociodemographic Characteristics of the Patients (n = 301)

VARIABLE	M ± SD OR N (%)
Age	35.3 ± 7.6
Education	
High school diploma	123 (40.9%)
Bachelor's degree	69 (22.9%)
Master's degree	48 (15.9%)
Postgraduate courses	35 (11.6%)
Middle school certificate	25 (8.3%)
Elementary school certificate	1 (.3%)
Marital status	
Married/committed relationship	188 (62.4%)
Single	106 (35.2%)
Divorced	7 (2.3%)
Employment status	
Employed	222 (73.7%)
Unemployed	40 (13.3%)
Student	39 (13.0%)
Nationality	
Italian	291 (96.7%)
Other	10 (3.3%)

Abbreviation: SD, standard deviation.

Table 2. Clinical Characteristics of the Patients (n = 301)

VARIABLE	M ± SD OR N (%)
Menstrual cycle characteristics	
Amenorrhea due to hormonal treatment	152 (50.7%)
Between 21 and 30 d	105 (35.0%)
<21 d of duration	18 (6.0%)
Between 31 and 35 d	16 (5.3%)
>35 d of duration	9 (3.0%)
Obstetrics history	
Nullipara	232 (77.1%)
Age at first childbirth	30.2 ± 4.7
Live birth (≥1)	69 (22.9%)
Miscarriage (≥1)	52 (17.3%)
Previous endometriosis surgical treatment	
Yes	145 (51.8%)
No	156 (48.2%)
Age at diagnosis	29.2 ± 7.4
Age at onset of pain symptoms	19.1 ± 8.9
Diagnostic delay	10.2 ± 8.3
Hormonal therapy	
Yes	222 (73.7%)
No	79 (26.3%)
Type of therapy	
Progestins	165 (54.8%)
Estrogen-progestins	39 (13.0%)
Type of endometriosis	
Ovarian endometrioma	115 (38.2%)
Deep endometriosis	130 (43.2%)
Both ovarian and deep	56 (18.6%)
Endometriosis-related pelvic pain symptoms	
Dysmenorrhea*	6.6 ± 2.9
Dysmenorrhea ≥5	122 (40.5%)
Dyspareunia†	5.1 ± 3.1
Dyspareunia ≥5	184 (61.7%)
Acyclic pelvic pain	6.8 ± 2.7
Acyclic pelvic pain ≥5	244 (81.1%)
Dyschezia	3.6 ± 3.3
Dysuria	1.9 ± 2.6
Body Mass Index	23.1 ± 4.4
Pain severity (MPI)	3.8 ± 1.5
Depressive symptoms	
HADS	7.7 ± 3.8
HADS ≥8	145 (48.2%)
Interoception	
MAIA_Self regulation	2.3 ± 1.2
BPQ_Awareness	80.7 ± 15.1

Abbreviations: SD, standard deviation; MPI, Multidimensional Pain Inventory; HADS, Hospital Anxiety and Depression Scale.
*Measured only in individuals with regular period (49.3%).
†Measured only in individuals who had intercourses in the last 3 months (61.4%).

correlated with Body Mass Index (r = .13, P = .026), amenorrhea due to hormonal therapy (r = .13, P = .029), and body awareness (r = .37, P < .001), and negatively correlated with interoceptive self-regulation (r = −.35, P < .001). Diagnostic delay positively correlated with both body awareness (r = .13, P = .036) and interoceptive self-regulation (r = −.15, p = .011).

We examined the indirect effect of pain severity on depressive symptoms through negative body awareness and interoceptive self-regulation, with amenorrhea due to hormonal therapy, education, diagnostic delay, and Body Mass Index inserted as covariates. Preacher and Hayes[80] bootstrapping estimates of indirect effects were employed for the mediation analysis. The overall model was significant ($F_{(6, 295)}$ = 19.174, P < .001, adj. R^2 = .335). Fig 1 displays the standardized regression coefficients among the model variables. The mediational model (Fig 1) revealed a significant indirect effect of the impact of pain severity on depressive symptoms through negative body awareness (β = .121, 95% bootstrap CI [.174, .468]) and a significant indirect effect of the impact of pain severity on depression through interoceptive self-regulation (β = .05, 95% bootstrap CI [.035, .252]). Findings support the total effect of pain severity on depression (β = .39, 95% bootstrap CI [.719, 1.333]). Furthermore, the direct effect of pain severity on depressive symptoms in the presence of the mediators was also significant (β = .21, 95% bootstrap CI [.267, .856]). Hence, both body awareness and interoceptive self-regulation partially mediated the relationship between pain severity and depressive symptoms.

Conclusions

The present study aimed to examine the impact of pain severity on depressive symptoms in women with endometriosis, while also investigating the mediating role of interoceptive sensitivity (ie, body awareness for uncomfortable or threatening stimuli and interoceptive self-regulation). Our hypothesis posited a direct influence of pain severity on depressive symptoms, along with an indirect relationship mediated by both negative body awareness and interoceptive self-regulation. Consistent with our hypothesis, the findings indicated that pain severity positively predicted depressive symptoms, with both negative body awareness and interoceptive self-regulation partially mediating this relationship. To our knowledge, the current study is the first to highlight the

Table 3. Matrix of Correlations

VARIABLE	1	2	3	4	5	6	7	8	9	10
1. Age	-									
2. Education	.06	-								
3. Diagnostic delay	**.17***,**	**.12***	-							
4. Body Mass Index	**.15****	−.10	.03	-						
5. Hormonal therapy	−.09	.04	**−.12***	.02	-					
6. Amenorrhea	−.08	−.04	−.01	−.01	**.58****	-				
7. Parity	**.39****	−.06	.06	.09	−.01	−.04	-			
8. Pain severity	−.05	**−.13***	**.17***	**.17***	−.01	−.06	.05	-		
9. Depressive symptoms (HADS)	−.01	−.10	.07	**.13***	.09	**.13***	.05	**.37****	-	
10. Body awareness (BPQ)	−.05	−.08	**.13***	.07	−.01	−.01	−.01	**.38****	**−.37****	
11. Self-regulation (MAIA)	.08	.08	**.15***	.02	.01	.01	−.01	**−.17****	**−.35****	−.05

Abbreviation: HADS, Hospital Anxiety and Depression Scale.
* < .05.
** < .01.

mediational role of these 2 facets of interoceptive sensibility in the relationship between pain severity and depressive symptoms in endometriosis patients.

The Relationship Between Pain Severity and Depressive Symptoms

Our findings highlight a high frequency of depressive symptoms in women with endometriosis, in line with the prevalence reported in previous research.[24,26,37] Consistently with the literature,[82-84] a positive direct association between pain severity and depressive symptomatology has also emerged.

Different pathways may lead to increased depressive symptomatology. Endometriosis-related pain triggers or exacerbates psychological distress, negatively affecting physical, sexual, and social domains of quality of life.[26,84,85] On the reverse path, literature has shown that depressive symptomatology amplifies pain perception in chronic pain patients[86,87] and in patients with endometriosis,[24] creating a vicious cycle that exacerbates both conditions. Within a biopsychosocial approach, various psychosocial factors (ie, cognitive tendencies and strategies, social support, etc) have been previously reported to interplay with psychophysiological and biological processes in shaping the experience of pain and the associated mental health symptomatology differently. Findings from the present study provide initial evidence of 2 underexplored processes that may play a role in maintaining the pain-depression cycle: heightened awareness of uncomfortable or threatening body signals and reduced interoceptive self-regulation. In this sense, endometriosis-related pain severity may contribute to the development or worsening of depressive symptomatology through these mechanisms.

The Mediating Role of Negative Body Awareness

The positive association between pain severity and body awareness of uncomfortable or threatening

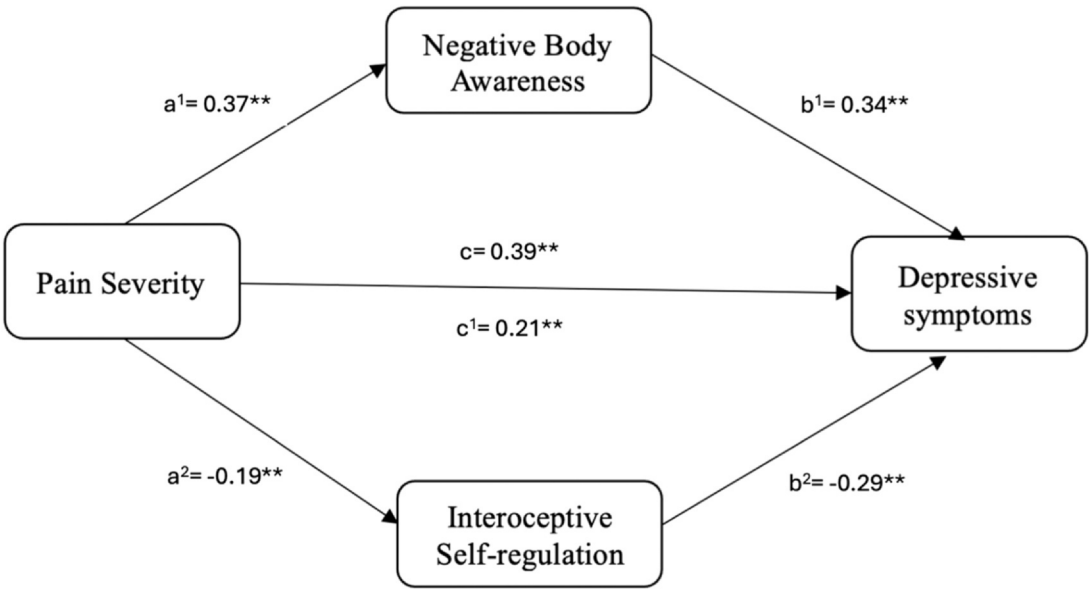

Figure 1. The parallel mediational model. Note: ***P* < .001.

stimuli, reported in our findings, extends previous studies conducted in nonendometriosis populations,[51,61] which showed that chronic pain patients tend to be more attuned to negative bodily sensations.[49,88,89] Patients with fibromyalgia, for example, reported greater body awareness of pain-related stimuli compared with healthy controls,[60] suggesting that this fostered focus on body signals may be an attempt to monitor and manage pain.[60,90] Nonetheless, a heightened awareness of somatic information may be potentially maladaptive,[91] increasing concerns, rumination, or feelings of helplessness, all common symptoms of depression.[55,92] Consistently, in our study, negative body awareness significantly mediated the relationship between pain severity and depressive symptoms.

The Mediating Role of Interoceptive Self-Regulation

A mediation of the ability to regulate negative emotions through conscious attention to body sensations was also found. Indeed, pain may interfere with the possibility of perceiving the body as a place of safety and calmness, leading the individual to be less body-connected and less able to benefit from its processes (ie, breathing) as a source of regulation. Congruently, previous studies on nonendometriosis patients showed that individuals with chronic pain reported impaired interoceptive self-regulation.[93] Reduced occasions to experience relief through body processes may, in turn, contribute to increased vulnerability to emotional distress, including depressive symptoms[51,94,95] both directly and through heightened dysfunctional regulation strategies (eg, rumination, catastrophizing, etc).[52,64,94,96] It may be important that future studies evaluate the interaction of interoceptive self-regulation with these processes.

Overall, our study provides a preliminary insight into 2 processes that may play a role in the complex relationship between pain severity and depressive symptoms in endometriosis patients, namely body awareness of threatening or unpleasant stimuli and interoceptive self-regulation. It is conceivable that pain triggers a process where individuals heighten their attention to negative body signals. Perceiving these stimuli as threatening and, in an attempt, to cope with them, individuals may avoid recurring to the body and its functions as a source of relief. Indeed, interventions working on the reappraisal of the pain sensations as nonthreatening through a combination of cognitive, mindfulness-based, emotional, and somatic techniques demonstrated their efficacy in managing pain in patients with several chronic pain conditions, including chronic back pain,[21,97,98] migraine,[99] irritable bowel syndrome,[100] and endometriosis.[101] Acknowledging the mediational role of negative body awareness and interoceptive self-regulation emerged in the present study, sheds some light on the potential paths that may be involved in the efficacy of the above-described interventions.

Despite the valuable insights provided by this study, several limitations need to be considered when interpreting these findings. First, it is not possible to make causal inferences from the cross-sectional design and to determine the temporal order of the observed relationship. The dynamic interactions over time between pain severity, negative body awareness, interoceptive self-regulation, and depression symptoms warrant further investigation. Intervention studies aimed to modify body awareness of threatening or unpleasant stimuli and interoceptive self-regulation may shed light on these relationships. Second, considering the methodological issues, the use of self-report questionnaires raises the risk of response bias and may not fully capture the complexity of the constructs under investigation. Including objective measures, like physiological assessments or clinician-rated evaluations, could improve the validity of the findings. In conducting the mediational analysis, we used multiple hierarchical regression analyses through the macro PROCESS. Although this method holds merit for estimating mediation and conditional processes in regression-based models involving observed variables,[79] future research could benefit from accounting also for measurement errors (ie, structural equation models), thereby providing unbiased structural coefficients.[102]

Third, additional clinical information that could have improved the generalizability of our findings may not have been recorded. This could have included a measure of pain days per month and opioid use, along with the prevalence of other pain-related comorbidities and chronic pain syndromes (eg, irritable bowel- or painful bladder syndrome). Including data on pelvic floor spasms and myofascial trigger points could have additionally contributed to a more precise understanding of how pain experience impacted mental health. Our gynecologists could ascertain the diagnosis of endometriosis only for women recruited at the hospital outpatient service. Women recruited online stated that they had previously received a diagnosis of endometriosis from other clinicians/gynecologists through gynecological examinations, imaging results, or surgical procedures. However, the confirmation of the diagnosis by our gynecologists was not possible, as the women came from different regions of the country, and asking all of them to access the outpatient service would not have been feasible.

Fourth, the generalizability of the findings is also limited by the specific characteristics of the sample, primarily composed of women of Caucasian origin. The low percentage of women from other ethnicities partly reflects the lower presence of foreigners in Italy compared with other European countries and partly may be due to the inclusion criterion of speaking Italian. Moreover, it may also result from the greater lack of disease awareness and reduced access to diagnostic examinations among ethnic minority groups. Future studies should consider representative samples involving local minority communities and adopting ad hoc measurement instruments including language-adapted questionnaires.

Finally, based on previous research on the association of interoceptive sensibility with pain severity or

intensity,[51] we focused only on how pain severity may alter body perceptions. We did not include pain interference as a variable in the model, as it evaluates more generally the consequences of pain on daily, work, and leisure activities. Nevertheless, future studies may investigate how psychosocial factors interact with pain interference and different aspects of quality of life to influence depressive symptoms.

Notwithstanding these limitations, our study underscores the importance of considering body awareness, and interoceptive self-regulation, as factors that influence the relationship between pain severity and depressive symptoms in endometriosis patients. These findings contribute to integrating body-mind connections more explicitly into current theoretical biopsychosocial models. Addressing interoceptive sensibility may offer promising possibilities for developing targeted interventions to alleviate the psychological distress experienced by individuals with endometriosis. Further research is warranted to explore these mechanisms in greater detail and to evaluate the efficacy of targeted interventions that may improve the well-being of individuals living with endometriosis.

Disclosures

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The authors declare that they have no conflicts of interest.

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