TH152 Predictive Psychosocial Factors for Pain Improvement in Multidisciplinary Treatment for Chronic Pain

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➢ Background and Aim

The Pain Management Center at Hoshi General Hospital, Japan, employs a multidisciplinary approach for chronic musculoskeletal pain patients, addressing biological and psychosocial aspects, alongside quality of life (QOL) assessments through questionnaires[1]. Evaluation is performed at the initial examination before treatment, and follow-ups at three and six months post-treatment. While our main therapeutic goal is QOL enhancement, we would like to improve pain itself. However, it remains unclear which psychosocial factors influence improvement of pain itself.

This study aims to identify predictive psychosocial factors influencing pain improvement before initiating multidisciplinary treatment for chronic musculoskeletal pain.

[1] Takahashi N, Takatsuki K, Kasahara S, Yabuki S. Multidisciplinary pain management program for patients with chronic musculoskeletal pain in Japan: a cohort study. *J Pain Res*. 2019; 12: 2563-2576.

Table 1. Results of the statistical analyses by age and sex

	Entire group n = 98	Improvement group n = 53	Aggravation or no change group n = 45	p-value
Age, years [1)]	50.4 (13.4)	51.2 (13.15)	49.4 (13.82)	0.44
Sex [2)] Male/female	37/61	21/32	16/29	0.65

We calculated the mean and standard deviation for each measure for the 98 patients with valid questionnaires. Numerical value: mean (standard deviation)
[1)] Statistical analysis using the chi-square test.
[2)] Statistical analysis using the unpaired t-test.

Abbreviations:
PCS, Pain Catastrophizing Scale;
PDAS, Pain Disability Assessment Scale;
HADS, Hospital Anxiety and Depression Scale;
PSEQ, Pain Self-Efficacy Questionnaire;
AIS, Athens Insomnia Scale;
BS-POP, Brief Scale for Psychiatric Problems in Orthopaedics Patients;
SD, standard deviation.
CI, confidence interval.

➢ Methods

A cohort study involving 98 participants with valid responses from July 2015 to March 2023. Data collected included participants' age and scores on the Brief Pain Inventory (BPI), Pain Catastrophizing Scale (PCS), Pain Disability Assessment Scale (PDAS), Hospital Anxiety and Depression Scale (HADS), Pain Self-Efficacy Questionnaire (PSEQ), EuroQol Five Dimensions Questionnaire (EQ-5D) and Athens Insomnia Scale (AIS). For the statistical analyses, we performed univariate and/or multivariate logistic regression analysis with the forced entry method. We classified the dependent variable into two groups: one is the improvement group (1), and the other is the aggravation or no change group (0). We determined the entry variable after the confirmation of the correction between the independent variable and the dependent variables. Finally, we analyzed the check-square test in order to investigate the ratio regarding the sex for the improvement group and the aggravation or no change group, and the attribution of ICD11 classification. All analyses were performed using the IBM SPSS version 25. We considered p-values less than 0.05 to be statistically significant in the variance analyses.

Table 2. Results of the statistical analyses in the ICD11 classification

	Entire group n = 98	Improvement group n = 53	Aggravation or no change group n = 45
Chronic primary pain	62	35	27
Chronic postsurgical and posttraumatic pain	13	5	8
Chronic neuropathic pain	7	2	5
Chronic musculoskeletal pain	16	11	5

Result of the chi-square test: p = 0.685 (no statistically significant difference)

All authors declare that they have no competing interests.

➢ Results

The results of the statistical analyses for age and sex are presented in Table 1 and for ICD11 in Table 2. The unpaired t-test and the chi-square test did not reveal significant differences between the improvement group and the aggravation or no change group by age, sex (Table 1), and ICD11 classification (Table 2).
Descriptive statistics including mean and standard deviation were calculated for each measure among the 98 patients with valid questionnaires before multivariate logistic regression analysis was performed. The results of descriptive statistics are displayed in Table 3.
In the multivariate logistic regression analysis using the forced entry method, the rumination subscale of the PCS (p = 0.047) was identified as the dependent variable that affected the improvement group and/or the aggravation or no change group (Table 4). The odds ratio was 0.868 (95% confidence interval: 0.755–0.998; Table 4).

Table 3. Results of the descriptive statistics

	Entire group n = 98 mean (SD)	Improvement group n = 53 mean (SD)	Aggravation or no change group n = 45 mean (SD)
PCS	35.0 (10.39)	35.2 (9.78)	34.8 (11.14)
PCS (Rumination)	14.7 (4.11)	14.2 (3.77)	15.3 (4.42)
PCS (Magnification)	7.3 (3.07)	7.4 (2.93)	7.1 (3.25)
PCS (Helplessness)	9.1 (4.63)	8.5 (4.87)	9.7 (4.30)
PDAS	25.8 (11.52)	25.2 (12.59)	26.6 (10.23)
HADS (Anxiety)	8.5 (4.42)	7.9 (4.02)	9.2 (4.80)
HADS (Depression)	9.1 (4.63)	8.5 (4.87)	9.7 (4.30)
PSEQ	25.3 (13.02)	26 (12.23)	24.4 (14.00)
AIS	9.1 (4.77)	8.9 (4.48)	9.4 (5.12)
Locomo 25	37.7 (21.04)	39.6 (22.22)	34.9 (19.29)
BS-POP (Doctor)	13.7 (2.24)	13.4 (2.17)	14.0 (2.30)
BS-POP (Patient)	19.9 (0.1942)	19.6 (3.51)	20.2 (3.99)
EQ-5D	0.525 (0.1942)	0.536 (0.1865)	0.525 (0.1924)

We calculated the mean and SD for each measure for the 98 patients with valid questionnaires.

Table 4. Results of the logistic regression analysis

	No adjustment odds ratio	p-value	Adjustment odds ratio	p-value
Age	1.010 (0.980–1.041)	0.510	1.016 (0.978–1.056)	0.408
PCS (Rumination)	0.933 (0.839–1.037)	0.199	0.869 (0.757–0.998)	**0.047**
PCS (Magnification)	1.029 (0.897–1.181)	0.679	1.171 (0.897–1.528)	0.246
PCS (Helplessness)	1.052 (0.972–1.138)	0.208	1.120 (0.983–1.276)	0.09
PDAS	0.989 (0.955–1.025)	0.989	0.992 (0.946–1.041)	0.75
HADS (Anxiety)	0.934 (0.852–1.025)	0.151	0.831 (0.690–1.001)	0.051
HADS (Depression)	0.948 (0.868–1.035)	0.231	0.907 (0.757–1.086)	0.29
PSEQ	1.010 (0.979–1.041)	0.544	0.983 (0.925–1.044)	0.579
AIS	0.974 (0.895–1.059)	0.537	1.083 (0.939–1.248)	0.272

No adjustment odds ratio (95% CI and p-value): The statistical analysis using single-variate logistic regression analysis.
Adjustment odds ratio (95% CI and p-value): The statistical analysis using multivariate logistic regression analysis.

➢ Discussion

Despite the importance of psychosocial factors in pain management, few studies have investigated predictive factors that are associated with changes in pain severity before multidisciplinary treatment for chronic musculoskeletal pain. Understanding these factors can help healthcare providers tailor treatment approaches and accurately predict patient prognosis. In this study, rumination significantly influenced changes in pain severity. However, how rumination values affected treatment outcomes at the initial examination remained unclear. Previous reports have demonstrated that rumination-focused cognitive-behavioral therapy significantly reduces depression, anxiety, and pain severity in patients with chronic low back pain. These studies have concluded that rumination-focused cognitive-behavioral therapy may provide benefits to patients with chronic low back pain when added to usual pharmacological treatment. These benefits could be attributed to targeting rumination as the key element of pain catastrophizing. This report, which highlights the correlation between rumination and changes in pain severity, corroborates our findings. Rumination is a cognitive pattern in which individuals repeatedly dwell on past negative events or unpleasant experiences. Therefore, each experience of repeated pain may be associated with fluctuations in the severity of the pain.

Our study has several limitations, including potential selection bias due to the inclusion of only patients with valid questionnaire responses. Additionally, we did not analyze individual pathological mechanisms or the impact of ICD11 classifications on treatment outcomes. Future research should further explore these factors to better elucidate the complexities of pain management. Finally, our study concluded that rumination significantly influences the changes in pain severity. However, how the rumination values affect treatment outcomes at the initial examination remains unclear; specifically, it is uncertain whether high or low values result in different treatment effects.

➢ Conclusion

The rumination, subscale of PCS, significantly influences pain improvement, aggravation, or no change. Lower rumination scores, evaluated at our hospital's initial examination, suggest improving the pain levels six months post-treatment. Emphasizing the rumination, subscale of PCS, we recommend its intensive consideration during the initial examination to effectively improving of pain itself.