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Original Research

Alexithymia in a Chinese Patient with Chronic Pain and Associated Factors: A Cross-Sectional Study

Ju-Hong Pei, Ph.D.[*,†], Xinglei Wang, M.D.[*], Tong Ma, M.D.[‡], Yehui Du, M.D.[*], Xinman Dou, Ph.D.[*,§,1]

[*] *Department of Nursing, Lanzhou University Second Hospital, Lanzhou, Gansu, China*
[†] *The first clinical medical college, Lanzhou University, Lanzhou, Gansu, China*
[‡] *Spine minimally invasive orthopedics, Gansu Provincial Hospital of Traditional Chinese Medicine, Lanzhou, Gansu, China*
[§] *School of nursing, Lanzhou University, Lanzhou, Gansu, China*

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ABSTRACT

Background: Alexithymia is more prevalent among those with patients living with chronic pain. Information on the prevalence of alexithymia in Chinese patients with chronic pain and associated factors is limited.

Aim: The primary objective of this study was to determine the prevalence of alexithymia, as defined by a score of 61 or greater in the 20-item Toronto Alexithymia Scale (TAS-20), in a Chinese patient with chronic pain. The secondary objective was to investigate the relationship between alexithymia and the clinical and psychological aspects of chronic pain.

Methods: A cross-sectional observational study used the TAS-20 to assess alexithymia of Chinese patients with chronic pain. Sociodemographic and clinical information were obtained and participants filled in the Fear Avoidance Beliefs Questionnaire, Hospital Anxiety and Depression Scale, Pain Catastrophizing Scale, and General Self-efficacy Scale.

Results: Of the 346 patients screened, 321 patients living with chronic pain were enrolled into the study. The prevalence of alexithymia among the study population (TAS-20 score ≥61) was 19.6% (95% confidence interval [CI]: 15.3-24.0). The findings showed anxiety (odds ratio [OR] = 2.474; 95% CI, 1.241-4.935), pain catastrophizing (2.649; 1.014-6.921), and self-efficacy (0.952; 0.908-0.988) as independent predictors of alexithymia in patients living with chronic pain.

Conclusions: Patients with chronic pain exhibiting alexithymia were at higher risk of pain catastrophizing, anxiety, and lower self-efficacy, compared with patients without alexithymia. It is important to identify and pay a special attention in clinical practice to patients with chronic pain exhibiting alexithymia, as these individuals are unable to properly express their emotions.

Chronic pain is characterized by pain lasting for three months or longer, occurring in approximately 30% of adults (Cohen et al., 2021). Chronic pain affects physical, social, and emotional functioning (Burke et al., 2015) and can be severely disabling (Huguet & Miró, 2008; Nahin, 2015), with increasing symptoms of depression and anxiety (Noel et al., 2016; Rayner et al., 2016).

Alexithymia is a personality trait associated with difficulties in affect regulation and describing one's emotions which are linked to deficits in cognitive experiential emotional responses (Sifneos, 1973). This term was first introduced by Sifneos in 1973, when he described the emotional deficits among psychosomatic individuals (Sifneos, 1973). Alexithymic individuals often exhibit externally-oriented thinking, an inability to readily identify or describe subjective feelings, restricted imaginative processes, and may be unable to differentiate between feelings and bodily sensations of emotional arousal (Sifneos, 1973). The etiology of alexithymia is not well known; however, it may include genetic factors, anatomical factors, insecure attachment with caregivers, and early traumatic events (Hogeveen and Grafman, 2021).

The relationship between alexithymia and several different chronic pain conditions such as fibromyalgia (Maes & Sabbe, 2014), migraine (La Touche et al., 2021), rheumatoid arthritis (Steinweg et al., 2011), chronic regional pain syndrome

[1] Address correspondence to Dr. Xin-Man Dou, Ph.D., Department of Nursing, Lanzhou University Second Hospital, No. 82, Cuiyingmen, Lanzhou, Gansu, People's Republic of China.
E-mail address: douxm@lzu.edu.cn (X. Dou).

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(Margalit et al., 2014), and chronic low back pain (Mehling & Krause, 2005) has been previously investigated. Compared with healthy samples, adults and youth with chronic pain have been found to have elevated alexithymia and may be associated with greater pain intensity and disability (Aaron et al., 2019; Di Tella & Castelli, 2016; Fresán et al., 2021). Furthermore, alexithymia is linked with depressive and anxiety symptoms in a variety of populations (Leweke et al., 2012; Li et al., 2015), including those with chronic pain (Aaron et al., 2019). Alexithymia is more prevalent among those with patients living with chronic pain (Aaron et al., 2019).

Information on the prevalence of alexithymia in Chinese patients with chronic pain and associated factors is limited. Prior studies have shown that alexithymia may vary across ethnic groups because of differences in the cultural value of attending to and expressing feelings and differences in socioeconomic factors such as education and income (Lumley et al., 2005; Makino et al., 2013; Salminen et al., 1999). Given these considerations, there is a need to investigate more closely the role of alexithymia in Chinese patients with chronic pain. Thus, the present study was designed to explore the association between the prevalence and degree of alexithymia and socio-demographic characteristics, pain duration, Barthel Index, anxiety, depression, fear avoidance beliefs, pain catastrophizing, and self-efficacy, as well as to supply useful information to improve the management of Chinese patients with chronic pain.

Methods

The research project was in accordance with the principles of the Declaration of Helsinki regarding medical research in humans, following local regulations. This study was approved by the Medical Ethical Committee of Lanzhou University Second Hospital and informed consent was obtained from the participants. This work was supported by Key research and development project of Gansu Provincial Science and Technology Department, China (No. YF8FA077).

Study Design and Participants

This was a cross-sectional study of an outpatient sample of individuals diagnosed with chronic pain (pain of at least 3 months' duration) (Cohen et al., 2021) from two tertiary hospitals in Western China conducted between June 2021 and February 2022. The inclusion criteria were: aged 18 years or older; willing to participate; and able to speak, write, and understand the Chinese language. The exclusion criteria were: having a significant cognitive impairment, severe psychopathology (e.g., major depression, psychosis, posttraumatic stress disorder, etc.), or malignant disease. The study subjects were asked to complete the questionnaires while waiting to be examined. Prior to inclusion, the study was fully explained by the study site personnel to all patients.

Assessments

Sociodemographic information: All participants answered a questionnaire collecting sociodemographic data, which included: age, sex, years of education, work status, religious belief, and marital status, as well as pain durations.

Alexithymia: Alexithymia was measured with the 20-item Toronto Alexithymia Scale (TAS-20) (Bagby et al., 1994). This scale is composed of seven items which measure difficulties associated with the identification of feelings (DIF subscale), five items that measure difficulties in describing feelings (DDF subscale), and eight items that assess externally oriented thinking (EOT subscale). A 5-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree') was used to score all items, with total possible TAS scores ranging from 20 to 100. Higher scores were considered to be indicative of higher levels of alexithymia according to the following cutoff criteria: non-alexithymia ($\leq$51), possible alexithymia (52-60), and alexithymia ($\geq$61). The Chinese version of this scale exhibited good internal consistency for the total score, the DIF factors, DDF factors, and EOT factors (Cronbach's alpha of 0.83, 0.78, 0.61 and 0.55, respectively) (Yi et al., 2003).

Barthel Index: The Barthel Index (BI) includes 10 items of basic activities of daily living (ADL): feeding, grooming, bathing, dressing, bowel and bladder care, toilet use, ambulation, transfers, and stair climbing (Mahoney & Barthel, 1965). Each performance item is rated on the scale of 2 (0 point or 5 points) to 4 (0, 5, 10, 15 points) points with a given number of points. The total score ranges from 0 (total dependence) to 100 (total independence), with higher scores indicating better physical functioning.

Fear Avoidance Beliefs: The degree of fear and avoidance on participants with chronic pain was completed using the Fear Avoidance Beliefs Questionnaire (FABQ) (Waddell et al., 1993). The FABQ consists of two subscales containing 16 items each, which are rated using a 7-point Likert scale (0 = completely disagree and 6 = completely agree). Two subscales have been identified in FABQ to assess avoidance beliefs about physical activity (FABQ-PA, 0–24) and beliefs regarding work (FABQ-W, 0–42). Higher scores were considered to be indicative of higher levels of fear-avoidance beliefs. The internal consistency of the Chinese version of the FABQ is α = 0.857, and reliability is r = 0.809 (Wu et al., 2010).

Anxiety and Depression: Anxiety and depressive symptoms were evaluated using the Hospital Anxiety and Depression Scale (HADS), which comprises two 7-item subscales, including anxiety and depression (Zigmond & Snaith, 1983). Response scores for the 14 items range from 0 to 3. The scores of the two subscales are calculated by the mean scores of the corresponding items for the scores ranging from 0 to 21. A score on a subscale is classified into three categories: within the normal range (0-7), suspected anxiety or depression (8-10), and presence of anxiety/depression ($\geq$11). The HADS is reliable and valid in Chinese populations, with Cronbach alpha coefficients for the two subscales of 0.76 and 0.79 (Lam et al., 1995).

Pain catastrophizing: Pain catastrophizing was measured by the Chinese version of the Pain Catastrophizing Scale (PCS) (Yap et al., 2008). The scale includes 13 items that describe thoughts and feelings that patients may experience when in pain. The scale has three dimensions: rumination (4 items), magnification (3 items), and helplessness (6 items). Patients rate their recent pain-related thoughts using a 5-point Likert scale ranging from 0 ("not at all") to 4 ("all the time"). The PCS total score is calculated by totaling the 13 items that vary between 0 (no catastrophizing) and 52 (severe catastrophizing), with a higher score indicating a higher perceived level of catastrophizing. Based on a Chinese study, we used a cutoff score of 38 or higher to represent a high degree of pain catastrophizing (Yap et al., 2008). The Chinese version of the PCS has shown a high internal consistency, with a Cronbach's alpha of 0.93 in patients with chronic pain.

Self-Efficacy: We used General Self-efficacy Scale (GSES) to assess self-efficacy among patients with chronic pain in our study (Schwarzer & Born, 1997). This scale is composed of 10 items. A 4-point Likert scale ranging from 1 ('totally incorrect') to 4 ('completely correct') was used to score all items, with total scores ranging from 10 to 40. Higher scores indicate a higher level of self-efficacy. The Chinese version of this scale exhibits good internal consistency (α= 0.87), and test-retest reliability (ICC r = 0.83) (Zhang & Schwarzer, 1995).

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Statistical Analyses

All data were analyzed using SPSS version 25.0 for Windows (IBM Corporation, Armonk, NY, USA) and R software (version 4.0.4, available at https://www.r-project.org/). Data normality was examined by the Kolmogorov-Smirnov test. Continuous variables are reported as mean ± standard deviation (SD), and categorical variables are reported as number and percentage. Social demographics and clinical variables were compared in the groups with and without alexithymia, using the $\chi 2$ or Fisher exact test for categorical variables and the independent samples Student *t*-test for continuous variables. Statistical significance was set at $p < .05$.

Exploratory logistic regression analysis was performed to assess the association between the presence of alexithymia and factors that could have affected the presence of alexithymia. Odds ratio (OR) and 95% confidence intervals (CI) for OR were calculated to indicate the degree of risk of the risk factors. Initially, univariate logistic regression analyses were performed with alexithymia as a dependent variable. Then variables with $p \leq .1$ in the univariate logistic regression analysis were ordered and entered step by step in the multivariate logistic regression analysis, the variables with the larger effect size entered first. Variables with a *p* value of ≤.05 were considered as possible predictors and were kept in the model. In order to support a clinically relevant interpretation of the model, depression, anxiety, and pain catastrophizing were treated as dichotomous variables (HADS-D, HADS-A ≥8 and PCS ≥38).

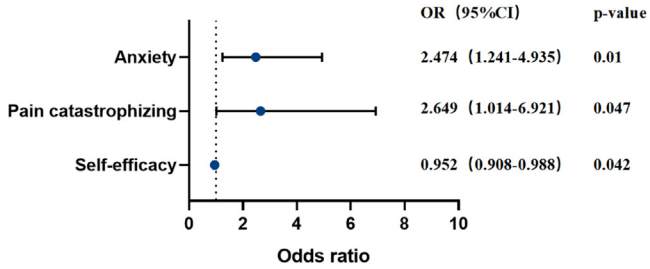

Figure 1. Multivariate logistic regression analyses of alexithymia.

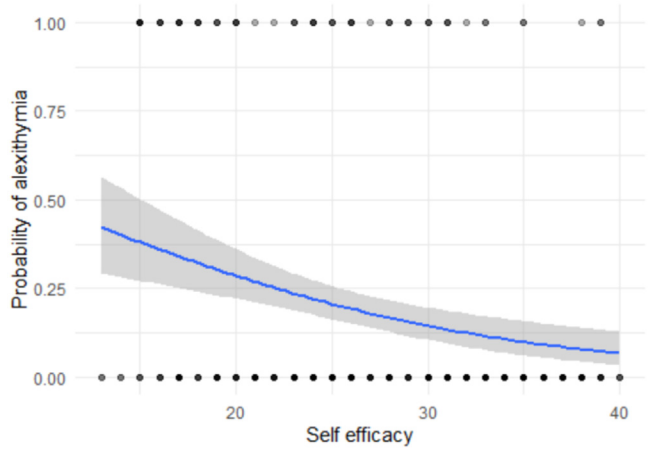

Figure 2. Predicted probability of alexithymia for self efficacy.

Results

Of the 346 patients screened, 321 patients with chronic pain were enrolled into the study. The prevalence of alexithymia among the study population (TAS-20 score ≥61) was 19.6% (95%CI: 15.3-24.0). The mean total TAS-20 score was 66.78 (SD: 5.23) in the alexithymia group versus 53.25 (SD: 4.24) in the no-alexithymia group. The mean age of these participants was 49.10 (SD: 13.55) years, with 99b(30.8%) male and 222 (69.2%) female patients. Among all the participants, the mean pain duration was 6.0 ± 6.91 years. Most of the participants (92%) were married. The participants' demographic characteristics are presented in Table 1.

As showed in Table 1, a χ^2 test showed significant associations between alexithymia and marital status, educational levels, and age. The two groups did not differ in terms of sex, religious belief, and work status. There was no difference of pain duration between the alexithymic (mean pain duration 6.16 years, SD 7.10) and the non-alexithymic (mean pain duration 5.32 years, SD: 6.05) groups.

The mean self-efficacy score was significantly higher in the non-alexithymic group (27.79 [SD: 6.85] versus 23.81 [SD: 6.73]). Alexithymic patients had significantly worse pain catastrophizing (PCS) scores (23.11 [SD: 12.90] versus 13.74 [SD: 9.24]), and higher mean anxiety (HADS-A) and depression (HADS-A) scores. Fear Avoidance Beliefs Questionnaire: work subscale (FABQ-W) scores indicated increased levels of fear avoidance beliefs about work in patients with alexithymic . However, the data can not support that there is a notable difference between the physical activity subscale (FABQ-PA) scores of two groups. There was no significant difference in BI scores between the two groups.

Table 2 shows the results of the univariate logistic regression analysis for the predictor variables in participants with or without alexithymia. The findings showed that marital status, FABQ-W score, anxiety, depression, pain catastrophizing, and self-efficacy were significantly related to alexithymia.

Variables with $p \leq .1$ in the results of univariate analysis were included in the multivariate logistic regression analysis. The findings showed anxiety (OR = 2.474; 95% CI, 1.241-4.935), pain catastrophizing (2.649; 1.014-6.921), and self-efficacy (0.952; 0.908-0.988) as independent predictors of patients with chronic pain exhibiting alexithymia. Figure 1 shows the results of the multivariate logistic regression.

The overall percentage of correctly predicted cases of alexithymia was 81.6%. The odds ratio for pain catastrophizing was the highest (2.649), meaning that the odds for a pain catastrophic patient also being alexithymic was about 164.9% higher than the odds for a non-pain catastrophic patient. The odds for a patient having anxiety was 147.4% higher than the odds for a non-anxious patient. Finally, the self-efficacy score, which was entered as a continuous variable in the model, showed an odds ratio of 0.952, meaning that each one-point decrease in self-efficacy score increased the odds of being alexithymic by 4.8%. The multivariate odds ratios for pain catastrophizing and anxiety were lower than the univariate odds ratios. This could be explained by the interaction between these and the other predictor. Predicted probability of alexithymia for self efficacy is presented in Figure 2.

Discussion

In the present study, the prevalence of alexithymia in patients with chronic pain conditions was 19.6%. Patients with alexithymia were at higher risk of pain catastrophizing, anxiety, and lower self-efficacy, compared with patients without alexithymia.

The prevalence of alexithymia in this sample is consistent with results reported in Saariaho's study (19.2%) (Saariaho et al., 2013), but it was lower than the 26% reported in a systematic review and meta-analysis of the prevalence of alexithymia in patients living with chronic pain (Aaron et al., 2019). In this meta-analysis,

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Table 1
Comparison of Social Demographics and Other Factors Between Alexithymia and No Alexithymia Groups (n = 321)

Variables	Total n = 321 n(%)	Alexithymia N = 63 n(%)	No alexithymia n = 258 n(%)	χ^2	*p*
S				0.30	.862
Male	99(30.8)	20(31.7)	79(30.6)		
Female	222(69.2)	43(68.3)	179(69.4)		
Religious belief				0.013	.908
Yes	37(11.5)	7(11.1)	30(11.6)		
No	284(88.5)	56(88.9)	228(88.4)		
Marital status				4.461	.035
Married	292(92.0)	53(84.1)	239(92.6)		
Single or separated	29(9.0)	10(15.9)	19(7.4)		
Educational levels				15.093	.005
Illiteracy	21(6.5)	6(9.5)	15(5.8)		
Primary school	64(19.9)	17(27.0)	47(18.2)		
Secondary school	71(22.1)	3(4.8)	68(26.4)		
Higher school	115(35.8)	24(38.1)	91(35.3)		
University or above	50(15.6)	13(20.6)	37(14.3)		
Work status				4.563	.207
Peasantry	100(31.2)	21(33.3)	79(30.6)		
Employed	127(39.6)	30(47.6)	97(37.6)		
Retired	62(19.3)	9(14.3)	53(20.5)		
Other	32(10.0)	3(4.8)	29(11.2)		
	Mean (SD)	Mean (SD)	Mean (SD)	t	*p*
Age	49.1(13.55)	46.33(14.42)	49.8(13.26)	1.886	.06
Pain durations (years)	6.0(6.908)	5.32(6.05)	6.16(7.10)	0.866	.387
BI score	93.12(10.09)	95.08(8.45)	92.64(10.41)	-1.729	.085
FABQ	41.85(16.82)	45.86(18.64)	40.87(16.23)	-2.121	.035
FABQ-PA	16.4(6.27)	17.33(6.22)	16.17(6.27)	-1.317	.189
FABQ-W	25.45(12.58)	28.52(14.54)	24.7(11.96)	-2.177	.030
HADS-A	5.33(3.85)	8.0(4.78)	4.67(3.27)	-5.228	<.001
HADS-D	5.60(4.20)	8.14(4.56)	4.97(3.87)	-5.091	<.001
Pain catastrophizing	15.95(11.34)	23.11(12.90)	13.74(9.24)	-6.557	<.001
Self-efficacy	27.01(6.99)	23.81(6.73)	27.79(6.85)	4.152	<.001

SD = standard deviation; BI = Barthel Index; FABQ = fear avoidance beliefs questionnaire; FABQ-PA = physical activity subscale of the FABQ; FABQ-W = work subscale of the FABQ; HADS-A = hospital anxiety and depression scale-anxiety ; HADS-D = hospital anxiety and depression scale-depression .

Table 2
Odds Ratios for Univariate Effects on Probability for Alexithymia Yes/No

Variables	Univariate OR (95% CI)	*p*
Marital status	2.373 (1.044-5.397)	0.039
Age	0.981 (0.961-1.001)	0.062
BI score	1.032 (0.995-1.069)	0.090
FABQ-W	1.024 (1.002-1.047)	0.032
Anxiety	4.234 (2.327-7.704)	<0.001
Depression	3.640 (2.049-6.468)	<0.001
Pain catastrophizing	6.416 (2.750-14.967)	<0.001
Self-efficacy	0.918 (0.879-0.958)	<0.001

OR = odds ratio; CI = confidence interval; BI = Barthel Index; FABQ-W = work subscale of the Fear Avoidance Beliefs Questionnaire.

some of the patient groups included represented one special subgroup of chronic pain such as fibromyalgia, headache, or chronic back pain. In this study and that of Saariaho (2013), the patient groups were heterogeneous groups of different chronic pain conditions. However, in these studies, the prevalence of alexithymia in patients with chronic pain was consistently higher than the 13% reported in the general population (Salminen et al., 1999). In addition, differences in regional and cultural backgrounds may also affect the results of the prevalence rate of alexithymia in this study.

The present study showed that alexithymia in patients with chronic pain was very closely linked to depression and anxiety. This finding was consistent with the results of a meta-analysis showing that alexithymia was also positively associated with depression and anxiety among adults with chronic pain (Aaron et al., 2019). Of note, the association was particularly strong with anxiety and was highly significant in our multivariate models. A study by Makino et al. (2013) also concluded that anxiety plays a more important role than depression underlying the relationship between negative affect and alexithymia in persons with chronic pain. A prior study in a subclinical population also found a direct relation with anxiety whereas the effect of depression would be indirect and mediated through anxiety (Berthoz et al., 1999). The same has been demonstrated also in adolescents (Jafar et al., 2021). One possible reason was that individuals with alexithymia are more susceptible to anxiety (Devine et al., 1999). However, there is also evidence that depression or anxiety could lead to reactive regression of emotional development and ultimately evoke alexithymic features (Sagar et al., 2021). As this is a cross-sectional study, it was not possible to conclude a causal relationship between alexithymia and anxiety.

Our analyses indicate that patients with chronic pain exhibiting alexithymia have significantly greater pain catastrophizing than the nonalexithymic patients, even in the multivariate models. The results of this study are also consistent with past findings suggesting a significant relationship between alexithymia and pain catastrophizing that has been found in patients with chronic pain from western countries (Katz et al., 2009; Shim et al., 2018). This finding also is similar to that of a previous study of Japanese patients with chronic pain (Makino et al., 2013). It is possible that the greater negative affect reported by individuals with alexithymia may be due to a limited ability to process emotions, which could lead to increased pain catastrophizing (Sullivan et al., 2001). Based on those findings, research is needed to determine whether treatments that reduce alexithymia lead to subsequent catastrophic improvements.

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We also found that Chinese patients living with chronic pain with a lower self-efficacy were more likely to report having alexithymia. This result corresponds to the results of previous studies (Lumley et al., 2002), which reported that lower levels of self-efficacy were associated with alexithymia. The study by Pecukonis (2009) also showed that women with chronic back pain had greater alexithymia and lower self-efficacy than control subjects. One possible reason was that self-efficacy affects the choice of individual emotion regulation strategies (Lacour et al., 2020). Those who are able to recognize their feelings, understand their implications, and express their emotional states are better able to face life's challenges (Zimmer-Gembeck et al., 2021).

Limitations

The limitations of this study include a self-reporting approach to data collection that was employed to assess study subjects, potentially biasing study results. Future research should include interview or observer-based measure of alexithymia, when possible. Second, while the sample were recruited from two tertiary hospital outpatient clinics, this analysis was nonetheless limited to a population who presented more severe pain problems. This may affect the distribution of our data. These results may therefore not be generalizable to other Chinese patients—especially perhaps those with less severe pain problems. Third, the study had a cross-sectional design. As such, we were not able to generate causal inferences. Future prospective longitudinal studies will be required to validate and expand upon our findings.

Despite these limitations, the results confirm that, at least in our sample of Chinese patients with chronic pain, alexithymia has a significant relationship with higher levels of pain catastrophizing, anxiety, and lower self-efficacy. These findings provide new knowledge about the epidemiology and understanding of alexithymia in Asian patients with chronic pain, which will provide a reference for more tailored treatment protocols for chronic pain patients. In addition, an 8-year follow-up study of chronic pain patients demonstrated alexithymia remained stable throughout the 8-year period (Saariaho et al., 2016). Moreover, there is already evidence that alexithymia may be partly modifiable with therapeutic interventions (Cameron et al., 2014). Future studies should examine whether treatments that reduce alexithymia lead to subsequent improvements.

Conclusions

In summary, the current study indicates a high prevalence of alexithymia in Chinese patients with chronic pain conditions that occur in approximately 1 in 5 patients. Alexithymia has a significant relationship with higher levels of pain catastrophizing, anxiety, and lower self-efficacy. The authors recommend screening for patients with chronic pain exhibiting alexithymia and giving special attention to those with alexithymia in clinical practice because they are unable to properly express their emotions.

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