The average age of the participants in the present study (n = 129) was 52.0 years (*SD*, 12.4, range = 22–85). Fifty-six percent of the sample was female (n = 72). Most of the participants were Caucasian (98%) and married (67%). The most common pain sites for both diagnostic groups were the lower back (66% MMD, 71% FSHD), and legs (71% MMD, 71% FSHD).

Measures

Demographic information. Participants were asked to provide demographic information regarding their age, gender, level of education, current employment status, ethnicity/race, and marital status. They were also asked to provide information related to their NMD, including NMD diagnosis, the specialization of the diagnosing physician, and nature of diagnosis confirmation (e.g., DNA testing, EMG testing).

Pain intensity. Study participants rated the average intensity of their pain in the past week on a 0 (*no pain*) to 10 (*pain as bad as it could be*) (Jensen, Karoly, & Braver, 1986) Numerical Rating Scale (NRS). Such scales are commonly used in pain research and have a great deal of evidence supporting their reliability and validity (Jensen & Karoly, 2001).

Metacognitions. The Thought Control Questionnaire (TCQ) (Wells & Davies, 1994) was used to assess metacognitions about pain-related thoughts. The TCQ was developed to assess metacognitive thought control strategies used for thought control when experiencing negative affect (i.e., anxiety and depression), and has five subscales, each of which has six items, that assess (1) Worry (e.g., "I focus on different negative thoughts"), (2) Punishment (e.g., "I punish myself for thinking the thought"), (3) Reappraisal (e.g., "I try to reinterpret the thought"), Distraction (e.g., "I do something that I enjoy"), and (4) Social Control (e.g., "I ask my friends if they have similar thoughts") metacognitions. Respondents indicate the frequency with which they engage in these metacognitive thought control strategies on a four-point Likert scale, ranging from *never* (1) to *almost always* (4). TCQ scores are calculated by computing the sum of all items, such that higher scores indicate more frequent use of each strategy. The range of possible scores is 6–36. The TCQ scales have demonstrated good to acceptable internal consistency coefficients (Cronbach's alphas = .65−.78) (Reynolds & Wells, 1999) as well as significant associations with measures of unwanted thoughts (e.g., obsessive ideas, worrisome thoughts) and psychological functioning (anxiety and depression symptoms) in clinical populations (Coles & Heimberg, 2005; Reynolds & Wells, 1999). In the current sample, the internal consistencies of the TCQ scales were also generally good—.69 for the Punishment scale, .72 for the Worry scale, .78 for the Reappraisal scale, and .79 for the Distraction Scale. One notable exception was the Social Control scale, which demonstrated low internal consistency (α = .39). Because of the very low internal consistency coefficient for the Social Control scale, as well as the fact that we did not have any specific hypotheses regarding this scale (see below), we did not include the Social Control scale in any of the subsequent analyses.

As discussed previously, we hypothesized that metacognitions targeting the management of negative cognitions would be associated positively with higher reported rates of negative cognitions, and that metacognitions targeting the management of adaptive cognitions would be associated positively with the reported frequency of adaptive thoughts. For the purposes of this study, we identified the TCQ Punishment and Worry scales as assessing metacognitions that focus on negative cognitions, and Reappraisal and Distraction as metacognitions that focus on adaptive cognitions. We did not have an a priori hypothesis about the associations between the TCQ Social Control scale and measures of catastrophizing or control cognitions, because this scale assesses how often the respondent talks with others about thoughts without regard to increasing positive or decreasing negative cognitions.

Pain catastrophizing. The PCS (Sullivan, Bishop & Pivik, 1995) was used to measure the frequency of catastrophic thoughts related to pain. The PCS consists of 13 items describing various thoughts that individuals might experience when they are in pain. Respondents indicate the frequency with which they experience catastrophic thoughts on a five-point Likert scale, ranging from *Not at all* (0) to *All the time* (4). Although the original version of this scale yield three different subscales (rumination, magnification, and helplessness), for this study we adopted a single summary score, with higher score indicating higher frequency of catastrophic thoughts. The range of possible scores is 0–52. The PCS has been shown to have high internal consistency (Cronbach's alpha = .87) and to be associated with heightened pain, disability, as well as employment status (Sullivan et al., 1995; Sullivan, M.J.L. Stanish, Waite, Sullivan M. & Tripp, 1998; Sullivan & Stanish, 2003). In the current sample, the Cronbach's alpha for the PCS was .93.

Control beliefs. In this study, we used a brief (two-item) version of the Survey of Pain Attitudes (SOPA) Control Scale (Jensen, Keefe, Lefebvre, Romano, & Turner, 2003) to assess the frequency of thoughts related to perceived control over pain. The two items state (1) "There is little I can do to ease my pain" (note, this item is reverse-scored) and (2) "I have learned to control my pain." Respondents indicate their agreement with these thoughts on a five-point Likert scale, ranging from *This is very untrue for me* (0) to *This is very true for me* (4). The SOPA score is calculated by computing the arithmetic mean of the two items (after the first item reverse-scored), such that higher scores indicate greater perceived control. The reliability and validity of the parent scale of SOPA Control Scale has been found to be good to excellent (Jensen et al., 1994; Strong, Ashton, & Chant, 1992). The two-item version of the scale has demonstrated a very strong association with the parent scale (rs = .83 and .87 before and after multidisciplinary pain treatment, respectively), an ability to detect change in control beliefs with multidisciplinary pain treatment, and a pattern of negative associations with validity criterion measures such as depression, pain disability, and pain intensity that is consistent with that of the parent scale (Jensen et al., 2003).

Procedures

All of the potential participants in this study had participated in a previous study completed two years before the current survey and had indicated that they would be interested in being contacted for further research opportunities. They were sent a second return-by-mail survey assessing clinical, demographic, and adjustment variables related to NMD and NMD-associated pain, including the measures described above. The surveys took approximately one hour to complete, and participants were compensated $25 on survey return. In the case of missing or incomplete responses, research assistants followed up with survey respondents over the

phone to obtain the most complete data set possible. The University of Washington Human Subjects Review committee approved all study procedures, and all subjects provided informed consent for their participation. The order of measures as presented to the participants was as follows: (1) Demographic/descriptive variables; (2) TCQ; (3) Pain intensity ratings; (4) PCS; (5) and pain control belief items (from the SOPA).

Data Analyses

As indicated previously, the TCQ Social Control was not included in analyses because of its low internal consistency as well as the fact that we did not have specific hypotheses about the association between this measure and the criterion variables in this study. We examined the actual ranges and distributions of the remaining study variables to ensure that they had a sufficient range and adequately normal distributions for meeting the assumptions of the planned analyses. Next we examined the zero-order associations among the other TCQ subscales and measures of catastrophizing, control beliefs by computing Pearson correlation coefficients. We then performed two regression analyses to determine the extent to which the TCQ scales could predict either (1) catastrophizing or (2) perceived control over pain, after controlling for baseline pain level.

Results

A summary of statistical properties of key outcome measures is presented in Table 1. As can be seen, there was an adequate range of responding (often covering the entire possible range of the scales) and adequately normal distributions of these variables, allowing us to continue with the planned analyses. The Pearson correlation coefficients between the TCQ scales and both catastrophizing and control beliefs are presented in Table 2. Consistent with the study hypotheses, the TCQ Worry and Punishment scales were both significantly and positively associated with greater catastrophizing, and the TCQ Reappraisal and Distraction scales were significantly and positively associated with perceived control over pain.

The results of the regression analyses predicting catastrophizing are presented in Table 3. Controlling for pain intensity, the TCQ scales made a significant (10% additional variance accounted for) contribution to the prediction of catastrophizing after controlling for average pain intensity. The Punishment scale was the only TCQ scale to make a significant and independent contribution to the prediction of catastrophizing when controlling for all of the other TCQ scales. The TCQ scales made a significant contribution to the prediction of perceived control over pain (13% additional variance accounted for; see Table 4), even when controlling for average pain intensity. The Reappraisal scale was the only TCQ scale to make a significant and independent (controlling for the other TCQ scales) contribution to the prediction of perceived control over pain.

Table 2
Zero-Order Correlation Coefficients Between the TCQ Scales and Both Catastrophizing and Control Beliefs

TCQ scale	Catastrophizing (PCS)	Control beliefs (SOPA)
Worry	.25**	.06
Punishment	.37***	−.02
Reappraisal	.03	.34***
Distraction	.04	.29**

Note. TCQ = Thought Control Questionnaire; PCS = Pain Catastrophizing Scale; SOPA = Survey of Pain Attitudes.
** $p < .01$. *** $p < .001$.

Discussion

The findings support the hypothesis that metacognitions as assessed by the TCQ are associated with the reported frequency of or agreement with two key pain-related cognitions (catastrophizing and control beliefs). The implications of these findings are discussed below.

Adaptive and Maladaptive Thought Control Strategies

We hypothesized that the thoughts that are the focus of attention, whether the intent is to decrease or increase those thoughts, leads to an increase in their frequency or intensity. Consistent with this hypothesis, the correlation analyses indicated that thought control strategies associated with attempts to directly decrease negative cognitions were associated positively with more catastrophizing cognitions, and thought control strategies associated with attempts to manage or increase positive cognitions were associated positively with more pain-related control cognitions.

The pattern of findings is consistent with (but does not prove, given the correlational nature of the data) the possibilities that (1) there may be metacognitions that influence the frequency or occurrence of

Table 1
Summary of Statistical Properties of Key Outcome Measures

Measure	Mean (*SD*)	Item range (scale range)	Response range	Skew	Kurtosis
Pain intensity	4.6 (2.4)	0–10 (0–10)	0–10	0.18	−0.68
Thought Control Questionnaire					
Worry subscale	1.6 (0.4)	1–4 (1–4)	1.0–3.0	0.54	0.05
Punishment subscale	1.5 (0.4)	1–4 (1–4)	1.0–2.8	1.25	1.66
Reappraisal subscale	2.2 (0.6)	1–4 (1–4)	1.0–3.4	0.09	−0.55
Distraction subscale	2.5 (0.7)	1–4 (1–4)	1.0–4.0	−0.05	−0.56
Pain Catastrophizing Scale	0.89 (0.8)	0–4 (0–4)	0.0–3.5	0.98	0.46
Survey of pain attitudes					
Control subscale	2.3 (0.9)	0–4 (0–4)	0.0–4.0	−0.11	−0.62

Table 3
Regression Analysis Results Predicting Catastrophizing (PCS) From TCQ Scores, Controlling for Average Pain Intensity

Step and variables	Total R^2	R^2 change	F change	*Beta* to enter
1. Average pain intensity	.21	.21	32.79***	.46***
2. TCQ scales	.31	.10	4.27*	
Worry				.09
Punishment				.27**
Reappraisal				−.08
Distraction				.05

Note. TCQ = Thought Control Questionnaire; PCS = Pain Catastrophizing Scale.
* $p < .05$. ** $p < .01$. *** $p < .001$.

specific thoughts and (2) thought control strategies might be more or less adaptive. For example, ruminating about negative outcomes (as reflected by the Worry scale of the TCQ), while possibly engaged in to help prepare for future negative events (Wells, 2001), might actually contribute to distress because of the focus on negative outcomes. In addition, direct efforts to decrease negative thinking by punishing oneself (as reflected by the Punishing scale of the TCQ) may paradoxically increase negative thoughts. After all, efforts to *not* think a specific thought require that it remain in one's consciousness (McCracken, 2005). On the other hand, pondering reassuring thoughts may be adaptive, in that this metacognitive strategy could lead to a higher frequency of adaptive thoughts.

The possibility that thought control strategies influence cognitions is consistent with research showing that worry and punishment have shown positive associations with the frequency of worrisome thoughts in patients with Generalized Anxiety Disorder (Coles & Heimberg, 2005) and obsessive ideas in patients with Obsessive-Compulsive Disorder (Abramowitz, Whiteside, Kalsy, & Tolin, 2003). Although previous research using the TCQ has focused entirely on negative cognitions (e.g., worrisome thoughts and obsessive ideation) and examined the (maladaptive) thought control strategies that may facilitate them, we were unable to identify any published studies that have investigated the associations between metacognitions and the frequency of positive or adaptive thoughts. This is the first study that sheds light on the possibility that certain thought control strategies may enhance positive cognitions; specifically, those thought control strategies that focus on positive thoughts.

Although all four of the TCQ scales examined demonstrated significant associations with the measures of catastrophizing and pain control beliefs as hypothesized, in the regression analyses, only the TCQ Punishment scale (predicting catastrophizing) and TCQ Reappraisal scale (predicting pain control beliefs) remained statistically significant when controlling for pain intensity and all of the other TCQ scales. As the regression analyses represent a more conservative test of the study hypotheses, these results do not necessarily mean that only punishment and reappraisal metacognitions are important, and that worry and distraction play no role in the content of patients' pain-related thoughts. However, these results do suggest that punishment and reappraisal may be particularly important, and perhaps should be the target of future experimental research that could determine whether changes in metacognitions influence the frequency of adaptive and maladaptive cognitions.

Distinctions Between Metacognition and Cognitive Content Measures

The modest correlations we found between the TCQ scales and measures of catastrophizing and pain beliefs provide clear evidence that they do not measure the same thing. That is, the TCQ scales assess domains that differ in important ways from measures of pain beliefs and catastrophizing, although our study indicates that they are related. This raises the possibility that the TCQ and perhaps other measures of metacognitions may contribute to our understanding of pain and the impact of pain on people's lives over and above the contribution made by measures of cognitive content and coping responses alone. Future research should consider adding measures of metacognitions, such as the TCQ, in studies that examine their contributions to pain and pain interference.

Catastrophizing has been viewed as both a (usually maladaptive) coping response (Sullivan et al., 2001) and a cognition domain (Jensen, Turner, Romano, & Karoly, 1991; Stroud, Thorn, Jensen, & Boothby, 2000). If catastrophizing is viewed as a type of cognition, an interesting question is whether it better represents cognitive content or a type of metacognition. An examination of the specific items of the PCS—a common measure of catastrophizing (Sullivan et al., 2001)—suggests that the domain of catastrophizing as measured by this scale may in fact represent a combination of metacognitions and cognitive content; that is, excessive focus and rumination (metacognition) about negative pain-related thoughts (content). Thus, neither thinking the occasional negative thought ("I briefly thought last week about how much I hurt") or ruminating about neutral or positive thoughts ("I keep thinking about how lucky I am") would be considered catastrophizing. Altering catastrophizing, then, might be achieved by focusing on changes in content (so that patients mostly think neutral or reassuring thoughts) or changing cognitive processes (so that patients ruminate less with any negative thoughts that remain). Future research could examine the relative impact of content-focused versus process-focused interventions on measures of pain-related catastrophizing.

Clinical Significance

Given that the findings indicate that metacognitions are distinct from cognitive content, clinicians who target both with treatment may get better outcomes than clinicians who target just one or the other. If one wants to lose weight, it is possible to focus on

Table 4
Regression Analysis Results Predicting SOPA Control Beliefs From TCQ Scores, Controlling for Average Pain Intensity

Step and variables	Total R^2	R^2 change	F change	*Beta* to enter
1. Average pain intensity	.09	.09	12.33***	−.30***
2. TCQ scales	.22	.13	4.83*	
Worry				.07
Punishment				−.10
Reappraisal				.28**
Distraction				.12

Note. TCQ = Thought Control Questionnaire; SOPA = Survey of Pain Attitudes.
* $p < .05$. ** $p < .01$. *** $p < .001$.

changing the food that is in the refrigerator (refrigerator content) or changing what you do with the food that is in the refrigerator (refrigerator "process"). Ultimately, people may lose more weight if they both keep the refrigerator stocked mostly with healthy food, *and* learn strategies to choose healthy food over high calorie desserts when faced with this choice. Cognitive content and metacognitions may operate in a similar way. By targeting *both* in treatment, clinicians increase their opportunity to facilitate positive change.

Although some of the proponents of "third wave" therapies might suggest that targeting cognitive processes (metacognitions) is more effective than targeting cognitive content, conclusions regarding the relative efficacy of interventions that alter each must await empirical study. It is possible that the relative importance of each treatment target may depend on person or other contextual factors; some patients may find it easier to change cognitive content, whereas others may find it easier and more practical to change cognitive processes. Until research results clearly indicate that changes in one or the other is more beneficial than changes in both, in our view, clinicians should target both cognitive content and metacognitions. Ultimately, the most effective clinician may be the one who is able to flexibly use both traditional and more contemporary therapeutic approaches to target the cognitive variables that are most important for each individual patient (Jensen, 2011).

When targeting cognitive content for change, many cognitive restructuring interventions (e.g., Ehde & Jensen, 2004) teach two strategies to increase the frequency of adaptive cognitions and decrease the frequency of maladaptive cognitions: (1) thought-stopping strategies to inhibit negative cognitions and (2) skills to develop and increase the frequency of reassuring cognitions. The current findings are consistent with the possibility that the first strategy (negative thought-stopping) alone may not necessarily lead to positive thought enhancement. Specifically, interventions that focus an individual's attention on examining thoughts from a detached viewpoint (as reflected by the Reappraisal scale of the TCQ) may result in thoughts incompatible with pessimism and negative mood, and ultimately prove to be the more effective component of cognitive restructuring interventions. Research is needed to further test this hypothesis.

Limitations and Future Directions

A primary limitation of the current study is the cross sectional nature of the data. Although cross sectional data can potentially be used to rule *out* causal relationships, given that the presence of an association is a necessary but not sufficient condition for causality, such data may not be used to prove causality. Thus, we cannot say based on this study that the metacognitions measured by the TCQ influence the content of cognitions directly. The findings would also be consistent with the possibility that thought content influences metacognitions, or that there are other variables not measured in the current study (e.g., traits such as dispositional optimism) that themselves influence both metacognitions and cognitive content and that therefore may explain some or all of the associations found between these variables. Experimental research is needed to examine how manipulating one domain (e.g., focusing on changing thought control strategies without directly seeking to alter content, or alternatively, focusing on changing content without changing process) may have a causal influence on the other domain and ultimately impact patient functioning. The current findings indicate that such research is warranted.

A second limitation of the study concerns the sample. The data for this study were collected as a part of a survey study of pain problems in individuals with disabilities, specifically, individuals with neuromuscular disease. Individuals with neuromuscular diseases often have to deal with a large number of medical issues, including that fact that they have a disease that has negative long-term implications for health and function. Although the presence of chronic pain is a problem for many of these individuals, other symptoms, such as fatigue, as well as significant disability associated with muscle weakness, can also contribute to dysfunction. Therefore, thoughts about pain may not be as much of a concern for many of these patients, relative to other ongoing health issues. These and other factors that make patients with neuromuscular disorders unique mean that the findings do not necessarily generalize to other patient populations. Research is needed to determine which of the current results generalize to other patient populations.

A third limitation of the study concerns the issue of potential selection bias. Not all of the potential participants in this study provided responses to the survey. The participants may therefore differ in some important (and unknown) way from the population of individuals with muscular dystrophy. Therefore, additional research with other samples of patients with muscular dystrophy is needed to help determine the generalizability of the current findings.

Despite the limitations of the study, the findings support the idea that metacognitive thought control strategies are associated with the reported frequency of both adaptive and maladaptive pain-related cognitions. Specifically, the findings suggest that the cognitions people focus on (whether their intent is to increase or decrease the frequency or impact of those cognitions) may increase in frequency and impact. If future experimental research demonstrates that the process of *focusing* on thoughts, regardless of intent, actually increases the frequency of thoughts, this would suggest that cognitive treatments should include strategies that decrease patient use of metacognitive strategies that focus on eliminating maladaptive thoughts (e.g., worry and punishment strategies) and increase patient use of metacognitive strategies that focus on adaptive thought content (i.e., reappraisal and distraction strategies). The findings from this study also suggest that research testing this hypothesis is warranted.

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資料論文

失体感症尺度(体感への気づきチェックリスト)の開発

—大学生を対象とした基礎研究—

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抄録：目的：失体感症を評価する質問紙である失体感症尺度を開発し，信頼性と妥当性の検討を行った．

方法：415名の大学生を対象にして，失体感症尺度予備尺度およびToronto Alexithymia Scale-20（TAS-20）への記入を依頼した．

結果：項目分析により「体感同定困難」「過剰適応」「体感に基づく健康管理の欠如」の3つの下位尺度，合計23項目からなる失体感尺度が開発された．失体感症尺度は，総得点および下位尺度のいずれにおいても，内的整合性が高く（α＝0.70～0.84），再検査信頼性も十分であった（r＝0.71～0.81）．失体感症尺度の総得点と下位尺度は，そのほとんどがTAS-20と有意に相関していた．

結論：失体感症尺度は失体感症を評価するためにはじめて標準化された質問紙である．大学生における信頼性は高く，ある程度の妥当性も示唆され，失体感症の研究や臨床応用に有望な心理テストであると考えられる．

Key words：失体感症，質問紙，妥当性，信頼性，体感への気づきチェックリスト

背景と目的

失体感症は[注)]，心身症患者の特徴として池見酉次郎により提唱された概念であり[1)]，身体感覚への気づきが乏しい状態を指す．池見は自身の臨床経験から，情動と身体への気づきの鈍麻が心身症の特徴であり，失体感症はSifneos[2)]の提唱する失感情症（感情の言語化が困難な心理的傾向）と同様，心身症の基本的病理であるとした[3)]．そのため失体感症は失感情症と不即不離の関係にあると考えていた[4)]．

しかしながら池見は，失体感症を明確に定義することなく，失体感症の特徴として多くの例を記載したため，他の研究者による失体感症の研究が困難なものになっている[5)6)]．失体感症の定義があいまいなまま現在に至った理由として，以下のような背景が考えられる．1973年，Sifneosがalexithymiaを提唱し，後に（1979年）池見が失体感症という概念を提唱するまでの間，「アレキシシミアの意味をもう一つ拡大し

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注）従来，失体感症はalexisomiaと英訳されてきた．Alexisomiaという造語は，alexithymia（a＝lack, lexis＝word, thymos＝mood）の概念，つまり失感情言語症（いわゆる失感情症）に対応する形で発表されたもので，失体感言語症の意味であれば，alexisomiaという訳を使用するのが適切である．しかし，池見は失体感症に関する母国語の著作では一貫して，体感への気づきの低下を主張し，表現（言語化）の障害に言及した著作は存在しない[6)]．そのため，本研究で扱う失体感症をalexisomiaと訳すと，失体感症の本質を表現しないばかりか誤解を与えかねない表現であると考えたため，本研究では失体感症の英語表記をshitsu-taikan-shoとしている．

て，『情動と身体の気づきの鈍麻』と解釈することによって，人間の疾病一般への理解をひときわ深化させる手がかりになる」[4]と述べるなど，池見はalexithymiaの概念を広義に解釈し，失感情症の中に失体感症を含めて論じていた．1979年，失体感症の概念を提唱したが，その論文[1]の中で，失体感症を定義しなかった．その後，池見は失体感症の例として多くの論述を残したが，和文と英文とでは異なる点を強調し，さらに失体感症の概念をしだいに拡大していった[6]．また，この間に，池見らは失体感症を評価するための質問紙法の作成を試みたが，成功しなかった[7]．その結果，後に多くの心療内科医が，身体疾患患者の中には失体感症的特徴がみられるという報告をしながらも，研究者によって，その定義や評価方法が異なるという混乱を招いたと考えられる．

そこでわれわれ[6]は，先行研究において，池見の著作から失体感症に関する論述を抜き出して整理し，失体感症の構成要素をまとめた．その結果，失体感症は①体調不良や空腹感などの，生体の恒常性を維持するために必要な感覚に気づかない，②疲労感などの，外部環境への適応過程で生じる警告信号に気づかない，③身体疾患に伴う自覚症状に気づかない，④身体感覚への気づきにもとづいた適切な対処行動をとったり体調管理することが困難，⑤自己破壊的ライフスタイル，⑥身体感覚を表現することが困難，⑦自然の変化に対する感受性や自然に接する機会が低下する，の7つの要素にまとめることができた．

次に，いまだ失体感症の標準的評価法が確立していないことも失体感症に関する研究を困難にしている一因と考えられる[5]．池見らは失体感症を含めた広義の失感情症を評価するために「感情と体への気づきチェック・リスト」[8]を開発したが，これは健常人と失感情傾向のある患者で有意差がなかった[7]．また，信頼性と妥当性の検討などの標準化は行われていない．したがって，失体感症に関する研究を推し進めていくためには，標準化された評価尺度を新たに開発する必要がある．

そこで，本研究では，失体感症を簡便に評価できる質問紙である失体感症尺度（体感への気づきチェックリスト）を開発し，その因子構造，信頼性と妥当性を検討することを目的とした．信頼性と妥当性について，以下の仮説を検証した．

1）失体感症尺度は十分な（0.7以上）内的一貫性と再検査信頼性をもつ．

2）失体感症は失感情症と相関するとされるので[4]，失体感症尺度は，失感情症を評価するToronto Alexithymia Scale-20（TAS-20）と有意な正の相関を示す．

対象と方法

1．対象者

総合大学の1年生441名である．男性332名，女性105名．記入漏れのための性別不明が4名であった．平均年齢は18.6±0.9歳（平均±標準偏差）．

2．質問紙

1）失体感症尺度予備尺度

a．失体感症構成要素の検討

前述のように，池見による失体感症の概念には，①体調不良や空腹感などの，生体の恒常性を維持するために必要な感覚に気づかない，②疲労感などの，外部環境への適応過程で生じる警告信号に気づかない，③身体疾患に伴う自覚症状に気づかない，④身体感覚への気づきにもとづいた適切な対処行動をとったり体調管理することが困難，⑤自己破壊的ライフスタイル，⑥身体感覚を表現することが困難，⑦自然の変化に対する感受性や自然に接する機会が低下する，の7つの要素が含まれる．今回の筆者らの検討では，その中から①～⑤の要素を失体感症の構成要素とした．今回の質問紙項目から⑥，

⑦の要素を除外した理由は，⑥身体感覚を表現することの困難という表現は英語論文の中でのみみられ，日本語論文の中ではまったく記載がみられないこと，⑦自然の変化に対する感受性や自然に接する機会の低下については，失体感症に付随して観察される現象であり，失体感症の根幹をなすものではないと考えたからである．

b．質問紙項目の作成

まず，失体感症構成要素①～⑤に合致する質問紙項目を，主に池見の失体感症に関する記述[6]と，1978年に作成された「感情と体への気づきチェック・リスト」[8]の項目から収集した．次に，われわれは，「感情と体への気づきチェック・リスト」[8]において失体感症を評価できなかった理由の一つは，失体感症を被験者の自覚症状だけに基づいて評価しようとした点にあると考えた．本来，感じるべき体感を感じることができない状態が失体感症であるので，自覚症状だけに基づく質問紙では限界があるのは当然である．そのため，この欠点を克服しながら失体感の状態を評価するために，池見による失体感症の記述を，他者評価と自己評価のずれによって表現しなおした項目を作成した．例えば「自分では無理をしているつもりはないが，人から無理のしすぎではないかと言われる」などである．さらに，失体感症構成要素③「身体疾患に伴う自覚症状に気づかない」については，痛みと発熱時における体のだるさを疾患の自覚症状として採用した．痛みや発熱時の体のだるさはさまざまな疾患，健常者で共通して感じられる自覚症状であるが，それ以外の自覚症状（例：呼吸困難など）は疾患特異的で，健常者，臨床群の両者に尺度を適用する場合に問題になると考えられたためである．このようにして予備尺度44項目を準備した（**Appendix**）．それぞれの項目は「ぜんぜんあてはまらない」（1点）～「まったくそのとおり」（5点）までの5件法のリカート尺度で評定することとした．質問紙の1頁目に対象者の年齢，性別記入欄を作り，対象者の年齢と性別を調査した．

2）TAS-20

失感情症を評価する20項目の自記式質問紙である[9]．自分の感情に気づくことの困難である感情同定困難（例：しばしば，どんな感情を自分が感じているのかわからなくなる），感情の言語表現に困難を覚える感情伝達困難（例：自分の気持ちにぴったりの言葉をみつけるのは難しい），自己の内面よりも外的な事実へ関心が向かう外的志向（例：人と話すとき，その人の気持ちよりもその人の日常の行動に関する話題のほうを好む）の3つの下位尺度をもつ．TAS-20は失感情症評価の標準的な質問紙で，英語原版，日本版ともに十分な信頼性と妥当性が確立している[10][11]．

3．手続き

心理学の授業を受講している大学生に対し，無記名の質問紙調査を実施し，回収した．その際，研究目的での調査という趣旨を説明し，参加は自由意志であること，参加の有無は成績とは無関係であること，データは統計学的に処理され個人情報は保護されることを口頭で説明し，研究参加への同意を得た．同意した者だけが調査に参加した．全対象者441名中，218名については，妥当性検証のため，フェイスシート，失体感症尺度予備尺度とTAS-20への記入を依頼した（妥当性検証群）．妥当性検証群と別の223名については，再検査信頼性検証群とし，対象者は第1回目の調査でフェイスシートと失体感症尺度予備尺度のみに回答した．2週間後の心理学の授業に出席した学生に対して，もう一度失体感症尺度予備尺度への回答を求め，その場で回収した．

4．統計解析

データは平均±標準偏差（standard deviation：SD）で示した．

1）項目分析

全対象者のデータを用い，失体感症尺度予備尺度に欠損のない415名を解析対象とした．項目分析は因子分析（主因子法，プロマックス回転）を用いた．因子負荷量の高い項目を選ぶこと，各因子の内的一貫性が0.7を超えるようにすることを項目分析の方針とした．項目分析が終わった後，再度因子分析を行い，完成した尺度（23項目の失体感症尺度）の因子構造を確認した．

2）性差の分析

失体感症尺度の総得点および下位尺度について，性差の有無をt検定で分析した．$p<0.05$を有意差ありと判断した．

3）信頼性検証

失体感症尺度の総得点，下位尺度ごとにクロンバックのα係数を算出し，内的一貫性による信頼性の検討を行った．また，再検査信頼性検証群のデータについては，初回調査の2週間後の授業に出席し，第2回目の調査に参加した117名について，ピアソンの相関係数を用いて再検査信頼性を総得点，下位尺度ごとに算出した．

4）妥当性検証

妥当性検証群のデータについて，失体感症尺度とTAS-20に欠損値がない199名について解析を行った．失体感症尺度とTAS-20との相関を，ピアソンの相関係数を用いて評価した．

結果

1．対象者の特性

解析対象となった全対象者については，男性313名，女性99名，性別不詳3名で，平均年齢は18.6±0.9歳であった．妥当性検証群では男性162名，女性35名，性別不詳2名で，平均年齢は18.5±0.8歳であった．再検査信頼性検証群では，男性75名，女性42名で，平均年齢は18.5±0.8歳であった．

2．項目分析

因子数を決定するためのスクリーテストでは2または4因子解が示唆された．そこで1因子から5因子の間に適切な解があると推測し，解釈可能性を考慮して最適因子数を探索した．その結果，3因子解が因子の解釈可能性から最も適切であると考えられ，3因子解を採用した．次に3つの因子それぞれについて，因子負荷量0.5以上の項目を選んで下位尺度を構成し，各下位尺度のα係数を算出した．第3因子のみα係数が0.7以下だったため，第3因子に負荷量の高い項目を追加して，再度3因子解を指定して因子分析を行った．下位尺度と総得点のα係数を算出したところ，いずれも0.7を超えていたため，項目分析を終了した．

3．失体感症尺度の因子構造

完成した23項目の失体感症尺度を対象に，再度因子分析（主因子法，プロマックス回転）を行い，3因子が抽出された（**Table 1**）．第1因子は「自分では無理をしているつもりがないが，人から無理のしすぎではないかと言われる」，「疲れを感じない」などの項目から構成され，「体感同定困難」因子と解釈した．第2因子は，「休息が必要だと分かっているが，仕事（家事，学業）を優先してしまう」，「熱が出ても仕事（家事，学業）する」などの項目から構成され，「過剰適応」と解釈した．第3因子は「体調に気をつけている」，「病気になる前に体の不調に気づく」などの項目を含み，「体感にもとづく健康管理の欠如」と解釈した．各因子の因子間相関を**Table 1**に示した．第3因子のみ他の因子と負の相関を示したため，「体調管理をどうすればよいかわからない」以外の第3因子の項目は，以下の分析で逆転項目として扱った．また，抽出された3つの因子は以下の分析では下位尺度として扱った．

Table 1　失体感症尺度の因子分析（主因子法・プロマックス回転）結果と因子間相関

	factor 1	factor 2	factor 3	共通性
第 1 因子　体感同定困難				
自分では無理をしているつもりはないが，人から「無理のしすぎではないか」と言われる	0.73	0.08	0.10	0.56
自分ではゆったりしているつもりなのに，人から「もっとリラックスしなさい」と言われる	0.66	0.06	0.01	0.47
自分では緊張しているつもりはないが，人から「緊張している」と言われる	0.63	0.05	0.04	0.36
自分では疲れていると思わないが，人から「疲れているのではないか」と言われる	0.63	0.03	0.05	0.40
自分では平気だが，人から「体を壊すよ」と言われる	0.60	0.04	0.00	0.39
満腹感を感じない	0.59	0.12	0.07	0.32
疲れを感じない	0.58	0.10	0.00	0.29
疲れていても休みたいと思わない	0.54	0.17	0.01	0.42
緊張しているかどうかわからない	0.51	0.07	0.04	0.24
第 2 因子　過剰適応				
休息が必要だと分かっているが，仕事（家事，学業）を優先してしまう	−0.03	0.86	0.03	0.71
熱が出ても仕事（家事，学業）をする	−0.08	0.75	−0.08	0.52
眠くても仕事（家事，学業）を優先する	−0.06	0.71	0.06	0.46
体調が悪くても休まない	−0.03	0.62	0.02	0.37
仕事（家事，学業）をするときには，体調のことなど気にしない	0.08	0.53	−0.03	0.33
休息をとりたくても我慢する	0.21	0.50	−0.08	0.42
第 3 因子　体感にもとづく健康管理の欠如				
体調に気をつけている	−0.31	0.03	0.71	0.52
食生活に気をつけている	0.01	0.11	0.63	0.40
病気になる前に，体の不調に気づく	0.08	−0.09	0.48	0.22
気分転換をはかるようにしている	−0.03	0.16	0.44	0.22
適度な運動を心がけている	0.00	−0.18	0.43	0.21
お風呂に入るとリラックスした感じになる	0.06	−0.14	0.41	0.17
呼吸をととのえる（深呼吸をする）と，気持ちが落ち着く	0.04	0.03	0.38	0.14
体調管理をどうすればよいかわからない	0.23	0.01	−0.36	0.24
固有値	4.38	3.48	2.26	

因子間相関	factor 1	factor 2	factor 3
factor 1	—		
factor 2	0.50	—	
factor 3	−0.28	−0.04	—

4．失体感症尺度得点の性差

体感同定困難下位尺度で有意に女性が男性より高得点であった（男性 17.7±5.2 点，女性 20.2±6.7 点，$t=-2.501$，$p<0.05$）．それ以外の下位尺度および総得点では性差はなかった．

5．失体感症尺度の平均点と信頼性

失体感症尺度の合計点および各下位尺度の得点の平均，SD と α 係数，再検査信頼性係数を **Table 2** に示した．合計得点および各下位尺度の最低および最高得点は，合計点は 23〜115 点，体感同定困難は 9〜45 点，過剰適応は 6〜30 点，体感にもとづく健康管理の欠如は 8〜40 点である．α 係数は体感にもとづく健康管理の欠如下位尺度を除けばいずれも 0.8 を超えている．2 週間間隔の再検査信頼性は総得点，下位尺度とも 0.7 を超えていた．

6．失体感症尺度の構成概念妥当性

失体感症尺度と TAS-20 との相関を **Table 3** に示した．TAS-20 の平均点と SD は **Table 2** に示した．失体感症尺度の過剰適応と TAS-20 感

Table 2　各尺度の平均点と信頼性

	平均±標準偏差 (n=199)	α係数 (n=415)	再検査信頼性係数 (n=117)
失体感症尺度合計得点	56.3±10.2	0.83	0.78***
体感同定困難	18.1±5.6	0.84	0.71***
過剰適応	14.2±4.5	0.83	0.81***
体感にもとづく健康管理の欠如	21.4±3.8	0.70	0.75***
TAS-20 合計得点	54.1±9.1		
感情同定困難	18.2±5.5		
感情伝達困難	16.2±3.6		
外的志向	19.7±3.8		

***p<0.001

Table 3　失体感症尺度と TAS-20 との相関

	TAS-20			
	感情同定困難	感情伝達困難	外的志向	TAS-20 合計得点
失体感症尺度				
体感同定困難	0.45***	0.21**	0.19**	0.43***
過剰適応	0.28***	0.11	0.09	0.25***
体感にもとづく健康管理の欠如	0.17*	0.19**	0.14	0.24**
失体感症尺度合計得点	0.44***	0.24**	0.20**	0.45***

*p<0.05　**p<0.01　***p<0.001

情伝達困難および外的志向との間，および体感にもとづく健康管理の欠如と外的志向の相関を除けば，失体感症尺度と TAS-20 との相関は，総得点，下位尺度のいずれも有意な正の相関であった．

考察

本研究では失体感症尺度を開発し，大学生サンプルにおける，因子構造，信頼性と妥当性を検討した．その結果，3つの下位尺度，23項目からなる失体感症尺度が開発され，信頼性は十分で，ある程度の妥当性も支持された．

1．因子分析

予備尺度の因子分析の結果，「体感同定困難」「過剰適応」「体感にもとづいた健康管理の欠如」の3因子が見い出された．

第1因子は，失体感症の構成要素①「体調不良や空腹感などの，生体の恒常性を維持するために必要な感覚に気づかない」，②「疲労感などの，外部環境への適応過程で生じる警告信号に気づかない」に対応していた．第1因子は「自分では無理をしているつもりはないが，人から無理のしすぎではないかと言われる」など，客観的な所見と自覚的認知のずれを表現した項目や「疲れを感じない」など体感が同定できないことを表現した項目から構成され，「体感同定困難因子」と解釈された．

第2因子は，失体感症の構成要素⑤「自己破壊的ライフスタイル」に対応している．自己破壊的ライフスタイルの例として池見は，過労，生活リズムの乱れ，運動不足，仕事中毒などを挙げている[12]．この因子は「休息が必要だとわかっているが，仕事（家事，学業）を優先してしまう」「熱が出ても仕事（家事，学業）する」などの項目を含み，発熱や体調不良などの身体感覚への気づきはあるものの，外部環境への適応をより優先する行動を表しているため，「過剰適応因子」とした．

第3因子は，④「身体感覚への気づきにもとづいて体調管理することの困難」に対応している．第3因子には2種類の項目が含まれてい

る．ひとつは「病気になる前に体の不調に気づく」「お風呂に入るとリラックスした感じになる」などで，体調などの身体感覚に気づけることを表していると考えられた．もうひとつは「気分転換をはかるようにしている」「適度な運動を心がけている」などで，自己管理や健康管理を表現していると解釈された．そのため，第3因子は体調に注意を向け，それに気づけることと，その結果健康管理ができることを表していると解釈され，「体調にもとづいた健康管理の欠如」と命名した．

③「身体疾患に伴う自覚症状に気づかない」は因子としてまとまらなかった．予備尺度では，自覚症状として痛みや発熱時における体のだるさの項目が含まれていたが，因子負荷量が低く，項目分析の過程ですべて除去された．その理由は，今回の研究で用いた予備尺度では，自覚症状が痛みと発熱時における体のだるさだけで数が少なかったことが指摘できる．ある項目が因子としてまとまるためには，一因子あたり5個程度の変量が最低必要とされる[13]．あるいは，本研究の対象者が身体疾患有病率の低い大学生であったので，身体疾患関連の因子が表れなかったのかもしれない．しかし，質問紙項目の作成の項で指摘したように，身体疾患に伴う自覚症状は疾患特異的なものが多く，当該疾患に罹患しているごく少数の被験者でなければその項目を肯定しないため，結果的に因子としてまとまらない可能性がある．したがって，失体感症の評価として，身体疾患に伴う自覚症状に気づかない程度を評価する場合には，疾患横断的な一般的失体感傾向を査定する質問紙と同時に，その疾患の重症度を反映する検査値と自覚症状との乖離を評価する方法[5]を併用するのが適切と思われる．

2．性差

失体感症尺度の総得点および下位尺度得点は，体感同定困難下位尺度で女性が高値を示した点を除けば，性差はなかった．われわれの知る限りにおいて，失体感症に関する性差について言及した研究は見い出せなかった．失感情症を評価するTAS-20では，感情同定困難因子において女性が高得点を示しており[11]，本研究の結果と類似している．

3．信頼性

失体感症尺度の信頼性は，内的一貫性，再検査信頼性とも，仮説に一致して0.7以上と十分であった（**Table 2**）．一般的に心理テストの信頼性は0.7以上あれば十分とされる[14]．

4．妥当性

失体感症尺度およびTAS-20の総得点および下位尺度は，一部を除き正の相関を示し，仮説を支持する結果であった（**Table 3**）．失体感症概念を提唱した池見は，失感情症傾向の高い者では，情動と不即不離の関係にある身体感覚への気づきも抑制，つまり失体感症傾向にあると考えていた[4]．失体感症とほぼ正反対の概念である身体への気づき（body awareness）は，精神科外来患者で失感情症と逆相関すると報告されており[15]，また，気管支喘息では，失感情的でない患者の自覚的呼吸困難度は客観的な呼吸機能と相関するのに対して，失感情的な患者では，両者が相関しない者が多く，失体感症の傾向も強いと報告されている[16]．これらの知見から失体感症と失感情症は相関すると予想され，本研究の失体感症尺度はTAS-20と正の相関を示すはずである．本研究では，失体感症尺度合計得点および体感同定困難とTAS-20合計得点および感情同定困難との相関は中程度の正相関を示し，予測を支持した．これは失体感症尺度の妥当性を示唆すると考えられた．しかし，他の下位尺度同士の相関の多くは，有意ではあるが弱い正相関，あるいは無相関であった．本研究の結果によれば，失感情傾向の高い者は失体感傾向も高いとする池見の主張は，正確には，感情

が同定できない者は体感も同定困難であるという主張だと解釈すれば，本研究での結果との整合性が保たれる．

5．本研究の問題点

われわれが開発した失体感症尺度は大学生を対象として開発されており，大学生以外の一般健常人や臨床群での信頼性や妥当性は未検証である．また，失体感症は心身症患者の特性として見い出された概念であり，これが健常者の間でどのような意味をもつかは今後の実証研究が必要である．さらに失体感症尺度の基準関連妥当性の検証も課題である．基準関連妥当性の検証のためには，失体感症尺度のよりどころとした岡らによる失体感症の構成要素[6]を満たす者を失体感症と定義したうえで，心身症患者群を心身医学専門医が面接によって失体感症の有無を診断し，両群の失体感症尺度に有意差があるかを調査する必要がある．

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Appendix　失体感症尺度予備尺度項目

1. 休息をとりたくても我慢する
2. 自分では疲れていると思わないが，人から「疲れているのではないか」と言われる
3. 体のどこかに痛みがあっても無視する
4. 食事を抜いても平気だ
5. 疲れているかどうかわからないことがある
6. 気分転換をはかるようにしている（逆転項目）
7. 疲れた時は休息をとるようにしている（逆転項目）
8. お風呂に入るとリラックスした感じになる（逆転項目）
9. 自分の体の調子がいいのか悪いのかわからない
10. おなかがすいていても何も食べないことがある
11. 仕事（家事，学業）をするときには，体調のことなど気にしない
12. 痛みがひどくなるとわかっていても動いてしまう
13. 眠くても仕事（家事，学業）を優先する
14. 空腹感を感じない
15. 緊張しているかどうかわからない
16. けがをしても気づかないことがある
17. 食生活に気をつけている（逆転項目）
18. 体が無理をしているかどうかわからない
19. 夜遅くまで起きていても眠くならない
20. 病気になる前に，体の不調に気づく（逆転項目）
21. 自分では平気だが，人から「体を壊すよ」と言われる
22. 体調に，いいときと悪いときの波があることに気づく（逆転項目）
23. 体調を無視する
24. 満腹感を感じない
25. 体調に気をつけている（逆転項目）
26. 自分では無理をしているつもりはないが，人から「無理のしすぎではないか」と言われる
27. 疲れていても休みたいと思わない
28. 痛みを感じにくい方だ
29. 休息が必要だと分かっているが，仕事（家事，学業）を優先してしまう
30. 健康増進のための健康法を実行している（逆転項目）
31. 37℃程度の熱なら体のだるさを感じない
32. なぜ体調が悪いのかわからないときがある
33. 自分ではゆったりしているつもりなのに，人から「もっとリラックスしなさい」と言われる
34. 体調が悪くても病院にかからない
35. 体調に合わせて人付き合いをする（逆転項目）
36. おなかがすいていないときでも何か食べてしまう
37. 適度な運動を心がけている（逆転項目）
38. 体調が悪くても休まない
39. 熱が出ても仕事（家事，学業）をする
40. 呼吸をととのえる（深呼吸をする）と，気持ちが落ち着く（逆転項目）
41. 自分では緊張しているつもりはないが，人から「緊張している」と言われる
42. ゆったりしているつもりなのに，頭が冴えている
43. 疲れを感じない
44. 体調管理をどうすればよいかわからない

Abstract

Development of the Shitsu-taikan-sho Scale

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Objectives : "Shitsu-taikan-sho" refers to the condition of having difficulty in experiencing bodily feelings. This concept was firstly proposed by Dr. Yujiro Ikemi in 1979 as conditions commonly observed in patients with psychosomatic diseases. To date, however, there is no questionnaire to measure shitsu-tailan-sho. The present study aimed to develop a shitsu-taikan-sho scale and to test its reliability and validity.

Method : Four hundred and forty one undergraduate students completed the 44 item draft shitsu-taikan-sho scale. Two hundred and eighteen of them completed the draft scale and The Toronto Alexithymia Scale 20 item version (TAS-20). Two hundred twenty three of them completed the draft scale twice at two-week intervals.

Results : Exploratory factor analyses resulted in a 23-item instrument (The shitsu-taikan-sho scale) with an adequate oblique 3-factor structure : (1) Difficulty of identifying bodily feeling subscale, (2) Over-adaptation subscale, and (3) Lack of health management based on bodily feeling subscale. Results exhibited adequate internal consistency ($\alpha = 0.70$-0.84) and test-retest reliability ($r = 0.71$-0.81) of total score and subscales of the shitsu-taikan-sho scale. Correlations with TAS-20 suggested acceptable construct validity for the shitsu-taikan-sho scale.

Conclusion : The shitsu-taikan-sho scale is our very first instrument assessing the shitsu-taikan-sho. These findings suggested that the shitsu-taikan-sho scale is reliable, valid, and useful for clinical settings and research.

Key words : shitsu-taikan-sho, measurement, validity, reliability

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PSYCHOLOGY, PSYCHIATRY & BRAIN NEUROSCIENCE SECTION

Original Research Article

Global Catastrophizing vs Catastrophizing Subdomains: Assessment and Associations with Patient Functioning

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Abstract

Objective. The primary objectives of the current study were to 1) confirm the three-factor model of the Pain Catastrophizing Scale (PCS) items in a Japanese sample and 2) identify the catastrophizing subdomain(s) most closely associated with measures of pain and functioning in a sample of individuals with chronic pain.

Design. This was based on a cross-sectional observational study.

Setting. This study was conducted in a university-based clinic.

Patients. One hundred and sixty outpatients with chronic pain participated in this study.

Outcome Measures. Patients completed the PCS, the Brief Pain Inventory, and the Hospital Anxiety and Depression Scale; 30 patients completed the PCS again between 1 and 4 weeks later.

Results. Confirmatory factor analysis supported a three-factor structure of the Japanese version of the PCS, and univariate and multivariate associations with validity criterion supported the validity of the measure. Catastrophic helplessness was shown to make a unique contribution to the prediction of pain intensity, pain interference and depression, and catastrophic magnification made a unique contribution to the prediction of anxiety.

Conclusions. The findings support the cross-cultural generalizability of the three-factor structure of the PCS and indicate that the PCS-assessed catastrophizing subdomains provide greater explanatory power than the PCS total score for understanding pain-related functioning.

Key Words. Catastrophizing; Helplessness; Confirmatory Factor Analysis; Pain Catastrophizing Scale; Chronic Pain

Introduction

Pain-related catastrophizing has been defined as "an exaggerated negative orientation toward pain stimuli and pain experience" [1]. Catastrophizing is generally viewed as a maladaptive response to pain, and a large and growing body of research supports the importance of catastrophizing as a predictor of patient functioning [1–16]. Moreover, research supports catastrophizing as a potential mechanism that may explain chronic pain

treatment outcome [2–5]. The most common measures of catastrophizing used in this research are the catastrophizing scale of the Coping Strategies Questionnaire (CSQ) [17] and the Pain Catastrophizing Scale (PCS) [1]. The 6-item CSQ catastrophizing scale assesses global catastrophizing and has shown consistent associations with measures of pain intensity and functioning in individuals with chronic pain [18]. The 13-item PCS assesses three catastrophizing domains: Helplessness (five of the six items in this scale were drawn from the CSQ catastrophizing scale), Rumination, and Magnification. However, in the vast majority of studies that use the PCS, the overall composite score representing global catastrophizing is used [6,9–11,16].

Fewer studies have examined the relative importance of the specific catastrophizing subdomains. In the research that has been performed, the PCS Helplessness and Rumination scales have tended to be more consistently associated with measures of pain and pain-related functioning than the Magnification scale [7,12–15]. Specifically, the PCS Helplessness scale has been shown to be more strongly associated with poorer psychological functioning [8,19], pain intensity [20–22], and pain interference [23] than the other PCSs. Moreover, early-treatment reductions in catastrophic helplessness have been shown to predict late-treatment decrease in pain and interference, supporting a possible causal effect of this catastrophizing subdomain on these outcome variables [4]. In a different sample of patients, Sullivan and colleagues found that the PCS Rumination scale was the strongest predictor of pain and disability [24–26]. We were only able to identify two studies in which the PCS Magnification scale demonstrated significant associations with a criterion measure. In these studies, magnification catastrophizing contributed a significant amount of unique variance to the prediction of pain intensity (but not disability) in a sample of patients with whiplash injury [27] and in woman suffering from provoked vestibulodynia [28]. However, although some researchers have reported significant associations between measures of global catastrophizing and anxiety (e.g., [29]), we were unable to identify any study directly demonstrating that the catastrophizing subdomains predict anxiety in persons with chronic pain.

Because of the importance of catastrophizing for understanding adjustment to pain, and the demonstrated reliability and validity of PCS, the PCS has been translated into a number of languages, including Japanese, and some preliminary research on the cross-cultural generalizability of the importance of catastrophizing have been published [30–33]. One study found that PCS was significantly associated with pain intensity and pain interference in a sample of undergraduate Japanese students [34]. In a second study in a small (N = 46) sample of Japanese patients with burning mouth syndrome, catastrophizing was found to be significantly associated with pain intensity and a number of quality of life domains, such as psychological disability, social disability, and perceived handicap [35]. The findings from these initial studies suggest that the importance of catastrophizing to chronic pain adjustment found in patients from Western countries might generalize across cultures to patients from Japan. However, the importance of catastrophizing as a predictor of pain and dysfunction in samples of Japanese patients with mixed chronic pain problem samples has yet to be tested. Understanding the cross-cultural generalizability of findings is important as it speaks to the potential universality (vs specificity) of the findings, as well as the potential effects of culture on those findings.

Recently, several studies have examined the associations between ethnic group membership and catastrophizing in comparative studies using samples of African Americans, Hispanics, Asians, and Caucasians [35–37,39]. Two studies have found that catastrophizing mediated the associations between ethnicity and affective [38] and sensory pain responses [37]. Thus, catastrophizing may play an important role in understanding the differences in response to pain sometimes found between various ethnic and cultural groups.

As mentioned earlier, the PCS was originally developed to assess three domains of catastrophizing, and a number of exploratory and confirmatory factor-analytic studies in samples of patients from the United States have generally supported the three-factor structure of the PCS [30,40]. However, two studies suggest that a two-factor model (Rumination and a combination of the PCS Magnification and Helplessness scores) may be more appropriate in some samples [41,42]. The PCS factor structure has never been examined in Japanese patients with chronic pain; analyses to address this gap would be helpful to determine the cross-cultural generalizability of the two- vs three-factor structure of the PCS items.

As a group, the findings to date indicate that different catastrophizing domains may predict different pain-related criterion variables, although research suggests that helplessness catastrophizing may be more consistently associated with pain intensity and pain interference than the other catastrophizing domains. Additional research is needed to determine the relative importance of the different catastrophizing domains as they relate to pain intensity, pain interference, and psychological dysfunction, including anxiety. Such research has important clinical implications as it would be useful for clinicians to know which type of catastrophizing cognition(s) may need the most attention as targets of cognitive behavioral interventions in patients with chronic pain.

Given the above considerations, the primary objectives of the current study were to 1) confirm the three-factor model of the PCS items and 2) identify the catastrophizing subdomain(s) most closely associated with patient functioning in our clinical sample. Regarding the first objective, we hypothesized that a three-factor model of the PCS items would evidence the greatest support.

Regarding the second objective, and based on the limited research that has studied the importance of the specific PCS subscales, we hypothesized that the PCS Helplessness subscale would evidence the strongest associations with the criterion variables of pain intensity, pain interference, and psychological dysfunction. A secondary study objective was to evaluate the psychometric properties of the (Japanese) translated version of the PCS used in this study, to help determine the cross-cultural applicability of the construct as well as the PCS's ability to assess that construct in non-English-speaking patients with chronic pain.

Methods

Participants

The study participants were consecutive patients with chronic pain evaluated for possible treatment from April 2006 to September 2009 in the Department of Psychosomatic Medicine at Kyushu University Hospital in Japan. Eligibility criteria included: 1) 3 month or more history of pain; 2) an ability to read and write Japanese; 3) being 20 years old or older; and 4) a willingness to participate in the study. Exclusion criteria included: 1) the presence of psychotic symptoms; 2) an inability to read due to visual impairment; and 3) lack of consent for study participation. Seventy-three participants are excluded mainly because their pain duration was less than 3 months. There were no significant differences between participants and nonparticipants in age or sex distribution.

The study participants were asked to complete a number of pain-related measures while waiting for their consultation. The first 30 participants completed the Japanese version of the PCS (J-PCS) twice within 4 weeks (in the hospital and at home) in order to compute test–retest stability statistics for the measure in our sample. Only 30 participants were asked to provide retest J-PCS data because we determined that more were not needed for computing test–retest stability coefficients, and we wished to minimize assessment burden for the study participants. Participant responses to all questionnaires were reviewed by a research staff member when the data were collected, and any missing data or inappropriate responses were discussed with the patient to ensure as complete and accurate data as possible.

Measures

Japanese Version of the Pain Catastrophizing Scale

All participants completed the Japanese version of the Pain Catastrophizing Scale (J-PCS) [34]. The J-PCS consists of 13 items describing thoughts and feelings that individuals may have when experiencing pain. The J-PCS instructions ask participants to reflect on past painful experiences (no recollection time period is specified) and to indicate the degree to which they experienced each of 13 thoughts or feelings when experiencing pain on a 5-point Likert scale (ranging from 0 = "Not at all" to 4 = "All the time"). The J-PCS can be scored as an overall composite measure of catastrophizing (total score) or as three subscales representing each of three catastrophizing domains (assessing Rumination, Magnification, and Helplessness). Previous research with the English version of the PCS has shown adequate to excellent internal consistency for most of the scales (e.g., Cronbach's α: total PCS = 0.87, Rumination = 0.87, and Helplessness = 0.79), although the Cronbach's α for the Magnification scale has been marginal in most studies (e.g., α as low as 0.60) [1,24,25,43]. The internal consistencies of the J-PCS found in a nonclinical sample have replicated these findings (Cronbach's α for the total scale = 0.89, Rumination = 0.80, Magnification = 0.65, Helplessness = 0.81) [34]. In an exploratory factor-analytic investigation, using a principal component analysis with oblique rotation, the J-PCS items were found to factor into three components that were labeled Rumination, Helplessness, and Magnification in a sample of students [34]. The item loadings for these factors were very similar to those found in studies using the English version (with item 12 loading onto the Helplessness rather than the Rumination subscale) [34].

Validity Criterion Measures

Participants were asked to complete measures to assess four criterion variables: pain intensity, pain interference, depression, and anxiety.

Pain Intensity and Pain Interference

A Japanese version of the Brief Pain Inventory (BPI) [44] was used to assess pain intensity and pain interference. The 11-item BPI was originally designed for patients with cancer, but the measure has been subsequently validated in a large number of additional patient populations. A Japanese version of the BPI has also been developed and validated in a sample of patients with cancer pain [44]. Four BPI items assess pain intensity (current pain, least pain, worst pain, and average pain), and seven items assess pain interference (with seven domains of functioning such as walking, sleep, mood, and relations with others). Previous research has shown the BPI scales assessing these two domains to have excellent reliability (with internal consistencies ranging from 0.78 to 0.95) and validity (as measured by an ability to detect response to treatment and be associated with other important pain-related variables) [45–47]. Although the original BPI asks patients to rate their pain intensity and interference in the last 24 hours, other researchers have expanded the time frame to 1 week [48]. We used the 7-day time frame in this study in order to be able to assess usual or characteristic pain and avoid unreliability in measurement due to possible daily fluctuations in pain. In the current sample, the BPI intensity and interference composite scores showed

excellent internal consistency (Cronbach's $\alpha = 0.84$ and 0.89, respectively).

Anxiety and Depression

The Hospital Anxiety and Depression Scale (HADS) is a widely used 14-item self-report measure of anxiety and depression [49]. It has demonstrated reliability and validity in numerous settings and across cultures [50]. A Japanese version of the HADS has been developed and was used in the present study to assess the level of anxiety and depression in the sample [49]. In our sample, the Anxiety and Depression HADS scores showed excellent internal consistency (Cronbach's $\alpha =$ 0.81 and 0.78, respectively).

Data Analysis

SPSS 17.0J for Windows (SPSS Japan Inc., Tokyo, Japan) was used to compute descriptive statistics and to test the study hypotheses. We first computed the means and standard deviations of the study measures for descriptive purposes. Next, to test the study hypothesis concerning the factor structure of the J-PCS, we performed a series of confirmatory factor analyses (CFA) using AMOS 17.0 (SPSS Japan Inc.). Three models were tested: 1) the original three-factor structure suggested by Sullivan and colleagues [1]; 2) the two-factor structure reported by Osman and colleagues [41]; and 3) the three-factor structure elaborated by the previous study with Japanese students [34]. As single-factor structures in which all the items were hypothesized to load on a unique latent factor were rejected by several studies, we did not evaluate a single-factor model [31,42]. Model fit was evaluated using χ^2 statistics. In addition, to determine the best suitable model, several goodness-of-fit measures were computed because the χ^2 statistics are affected by a number of factors, such as sample size. The goodness-of-fit measures used were: 1) incremental fit index (IFI), in which IFI values close to 1 indicate a very good fit [51]; 2) root mean square error of approximation (RMSEA), a measure of the discrepancy per degree of freedom in the model [52]; 3) comparative fit index (CFI), a measure to assess the relative fit of the hypothesized model to a baseline model; and 4) Akaike information criterion (AIC), whereby lower AIC score indicates a better fit [52]. RMSEA values <0.08 or less indicate a reasonable error of approximation [52]. CFI values close to 1 indicate a good fit [51]. To evaluate the reliability of the J-PCS in our sample, we computed Cronbach's α and the intraclass correlation coefficients (ICCs) for the J-PCS total scale and subscales. To evaluate the validity of the J -PCS in our sample, we computed Pearson's correlation coefficients between the J-PCS and the criterion variables. Finally, to test the hypothesis that the PCS Helplessness scale would evidence the strongest associations with the study criterion variables (pain intensity, pain interference, anxiety, and depression), we performed four linear regression analyses (one for each criterion variable) with the J-PCS total scores and subscales as the predictor variables separately while controlling for demographic variables (age, gender, and pain duration). For each model, two separate steps 3 and 4 are presented, one using PCS subdomains as predictors and the other using the PCS total score as a predictor. In the regression analyses predicting pain interference, anxiety, and depression, pain intensity was entered as a control variable; in the analyses predicting pain intensity and pain interference, anxiety and depression were entered as control variables, which could influence both outcomes and catastrophizing.

Ethical Considerations

This study was approved by the Kyushu University Hospital Institutional Review Boards. All participants provided written informed consent prior to their participation.

Results

Participant Characteristics

One hundred and sixty Japanese patients presenting with chronic pain at the department of psychosomatic medicine in Kyushu University Hospital participated in this study. Age, gender, and pain-related characteristics of the sample are presented in Table 1. The average duration of pain reported by the study participants was about 4.8 years (range: 3 months to 40 years). The most common primary pain locations were the abdomen (15.0%), the lower back (14.4%), and the lower limb (12.5%). Other pain locations of the study participants are listed in Table 1. When we consider not only primary pain location

Table 1 Demographic characteristics of the study sample (N = 160)

Variable	Mean (SD) or Number (%)
Mean (SD) age, in years	51.27 (16.39)
Mean (SD) pain duration, in months	57.74 (79.78)
Gender	
Number (percent) of men	48 (30.0%)
Number (percent) of women	112 (70.0%)
Number (percent) married	79 (49.0%)
Primary pain location	
Abdominal pain, number (%)	24 (15.0%)
Low back pain, number (%)	23 (14.4%)
Leg pain, number (%)	20 (12.5%)
Head pain, number (%)	16 (10.0%)
Upper back pain, number (%)	16 (10.0%)
Neck pain, number (%)	10 (6.3%)
Shoulder pain, number (%)	10 (6.3%)
Arm and/or hand pain, number (%)	9 (5.6%)

SD = standard deviation.

Table 2 Means and standard deviations of study variables (N = 160)

Variable	Mean (SD)
Pain Catastrophizing Scale	
Total	33.85 (10.21)
Rumination	16.06 (3.86)
Helplessness	11.37 (5.09)
Magnification	6.42 (3.32)
Brief Pain Inventory	
Intensity	
Worst pain intensity	7.73 (2.17)
Least pain intensity	3.53 (2.66)
Average pain intensity	6.14 (2.05)
Current pain intensity	5.42 (2.75)
Composite intensity score	5.76 (2.03)
Interference	
Composite intensity score	5.80 (2.50)
Hospital Anxiety and Depression Scale	
Anxiety	8.07 (4.89)
Depression	10.00 (4.92)

HADS = Hospital Anxiety and Depression Scale; SD = standard deviation.

but also other pain locations, 70% of participants had pain in lower back, 63% in upper back, 57% in head, and 49% in abdomen. Almost all patients (92.5%) had multiple pain locations (average of 5.6 locations).

Means and Standard Deviations of the Study Variables

There were no missing data. The means and standard deviations of the study variables are reported in Table 2. Overall, the total score of the J-PCS appears to be somewhat higher than that found in English samples (common range of means in English-speaking samples, 23.8–28.0; our sample, 35.04) [24,42].

Confirmatory Factor Analyses

Based on the results of the preliminary modification indices [52] provided by the AMOS output, correlations between the error terms associated with items were allowed [33,53] (Figure 1). An examination of the content of these items shows that they appear to reflect and share some redundancy in content related to Helplessness. When the model was modified, the three-factor structure [34] was most consistent with the CFA findings in this study, as reflected by the IFI, RMSEA, CFI, and the AIC values (see Table 3).

Internal Consistency and Reproducibility of the J-PCS

The ICCs (Cronbach's α's) for the Helplessness, Rumination, and total J-PCS were acceptable; 0.77, 0.72, and 0.84, respectively. However, and consistent with previous findings regarding this scale, the internal consistency coefficient for the Magnification scale was marginal (Cronbach's α = 0.69). The J-PCS scores demonstrated adequate to excellent test–retest reliability, with ICC values

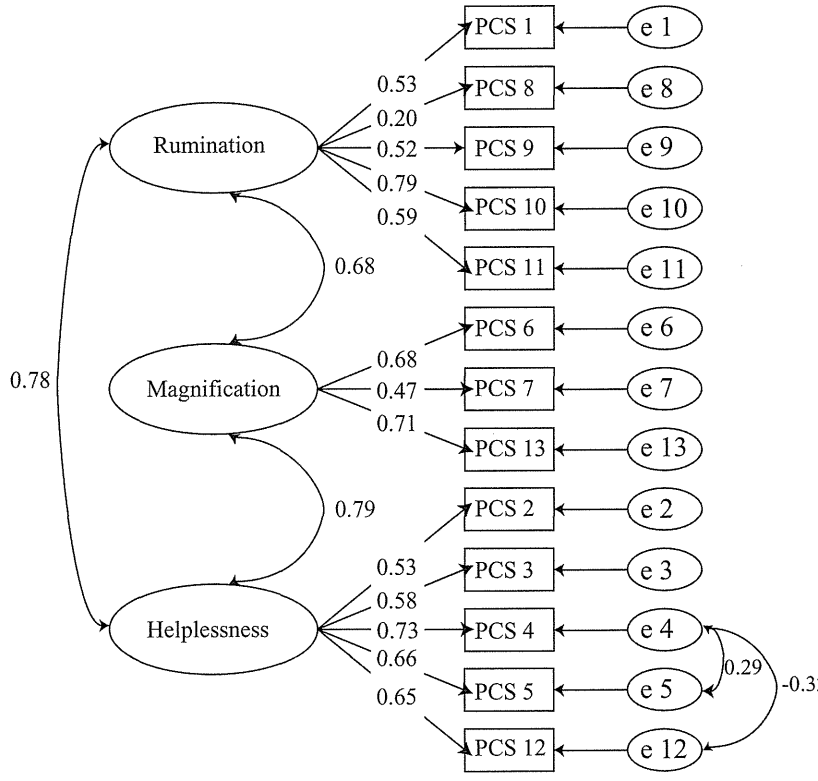

Figure 1 Three-factor model of the Japanese Pain Catastrophizing Scale (J-PCS) in patients with pain with standardized parameter estimates. The error terms allowed to covary were items 4 and 5 (e4, e5) and items 4 and 12 (e4, e12) from the Helplessness factor.