



Original Article

Hypervigilance to pain affects activities of daily living: an examination using the Japanese version of the pain vigilance awareness questionnaire

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Abstract. [Purpose] Hypervigilance to pain is an important aspect of the fear-avoidance model of pain that may be associated with disability more than other psychological factors examined. The aim of the study was to investigate how hypervigilance to pain influences disability compared with other psychological factors examined. [Subjects and Methods] The subjects of this study were 50 elderly patients with chronic pain (7 men and 43 women, 80.3 ± 7.8 years). To assess the pain level, the Numerical Rating Scale (NRS) was used. To assess psychological factors, the Hospital Anxiety and Depression Scale (HADS), the Tampa Scale for Kinesiophobia (TSK), the Pain Catastrophizing Scale (PCS), and the Pain Vigilance Awareness Questionnaire (PVAQ) were used. To assess activities of daily living, the Pain Disability Assessment Scale (PDAS) was used. A multiple regression analysis (stepwise method) was performed with the PDAS as the dependent variable, and the NRS, HADS-anxiety, HADS-depression, TSK, PCS-rumination, PCS-magnification, PCS-helplessness, and PVAQ, as the independent variables. [Results] The results of a multiple regression analysis showed that the PDAS scores were affected by the PVAQ and NRS scores. [Conclusion] Hypervigilance influenced disability more than other psychological factors examined.

Key words: Pain Vigilance and Awareness Questionnaire, Hypervigilance, Pain Disability Assessment Scale

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INTRODUCTION

Hypervigilance to pain is an important aspect of the fear-avoidance model of pain¹⁾, which is a prominent psychological model of chronic pain. This model explains how and why patients experiencing acute pain may become chronic sufferers and become trapped in a vicious circle of worse pain and disability. The fear-avoidance model of chronic pain¹⁾, which emphasizes the role of fear-avoidance in the development of pain problems, is an important cognitive-behavioral model of chronic pain. Several studies have investigated components of the model, including acquisition of pain-related fear²⁾, fear-disability association³⁾, catastrophizing⁴⁾, hypervigilance⁵⁾, and avoidance behavior⁶⁾.

Interest in hypervigilance, which is a component of certain persistent pain conditions, has grown steadily since it was first described⁷⁾, and the concept itself has undergone considerable development in the process. Hypervigilance is regarded as a cognitive tendency, reflecting worry about health concerns. The Pain Vigilance and Awareness Questionnaire (PVAQ) is an assessment tool for hypervigilance. The PVAQ was developed as a broad measure of attention to pain, which can be applied to various pain populations⁸⁾. The Japanese version of the PVAQ was developed and exhibited good reliability and validity⁹⁾. A previous study revealed that hypervigilance to pain is associated with activities of daily living¹⁰⁾; however, the extent to which hypervigilance influences disability has been unclear compared with other psychological factors examined. Based on the fear-avoidance model, we hypothesized that hypervigilance may influence disability more than other psychological

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factors examined. The purpose of this research was to investigate the influence of hypervigilance on disability compared with other psychological factors examined.

SUBJECTS AND METHODS

The subjects of this study were 50 elderly patients with chronic pain (7 men and 43 women, 80.3 ± 7.8 years). Subjects were excluded if they could not understand the questionnaire. The patients had been experiencing pain for at least 6 months. The pain areas were lower back (24 patients), lower limbs (17 patients), upper limbs (6 patients), and neck (3 patients). All the subjects provided written informed consent.

All subjects completed the outcome measures: the Numerical Rating Scale (NRS), the Hospital Anxiety and Depression Scale (HADS), the Tampa Scale for Kinesiophobia (TSK), the Pain Catastrophizing Scale (PCS), the Pain Disability Assessment Scale (PDAS), and the PVAQ. Pain level was assessed using the NRS, in which 0 implied no pain and 10 implied the worst possible pain. Psychological factors were assessed using the HADS, TSK, PCS, and PVAQ. The HADS, a self-report measure, was used to assess anxiety and depression related to pain and contains 14 items that are scored on a four-point scale¹¹. The TSK, also a self-report questionnaire, was used to measure fear of movement and (re)injury¹². It consists of 17 items that are scored on a four-point scale. The PCS is a self-report measure of catastrophizing related to pain and contains 13 items rated on a four-point scale¹³. It consists of three subscales (rumination, magnification, and helplessness). Hypervigilance to pain was assessed using the PVAQ, which measures the preoccupation with or attention to pain. It consists of 16 items (e.g., “I am very sensitive toward pain”) rated between 0 (“never”) up to 5 (“always”). Activities of daily living (ADL) were assessed using the PDAS, a self-report measure of ADL related to pain with 20 items rated on a four-point scale¹⁴.

A multiple regression analysis (stepwise method) was performed with the PDAS as the dependent variable, and the NRS, HADS-anxiety, HADS-depression, TSK, PCS-rumination, PCS-magnification, PCS-helplessness, and PVAQ, as the independent variables. The R version 3.3.1 was used to perform all statistical analyses. Statistical significance was set at 5%.

RESULTS

The mean scores of the NRS, HADS-anxiety, HADS-depression, TSK, PCS-rumination, PCS-magnification, PCS-helplessness, PVAQ, and PDAS are presented in Table 1. The multiple regression analysis showed that the PDAS scores were affected by the PVAQ and NRS scores (Table 2).

Table 1. Clinical characteristics of the patients

Variables	Mean \pm SD
NRS	5.08 \pm 1.98
HADS-anxiety	7.06 \pm 3.86
HADS-depression	7.04 \pm 2.58
TSK	40.06 \pm 5.32
PCS-rumination	12.88 \pm 5.50
PCS-magnification	5.65 \pm 3.30
PCS-helplessness	9.15 \pm 4.63
PVAQ	49.88 \pm 13.27
PDAS	32.75 \pm 12.66

NRS: Numerical Rating Scale; HADS: Hospital Anxiety and Depression Scale; TSK: Tampa Scale for Kinesiophobia; PCS: Pain Catastrophizing Scale; PVAQ: Pain Vigilance Awareness Questionnaire; PDAS: Pain Disability Assessment Scale.

Table 2. Multiple regression analysis (with PDAS as dependent variable)

Dependent variable	Independent variables	Standard partial regression coefficient	p-value
PDAS	PVAQ	0.43	<0.001
	NRS	0.28	0.03
$R^2=0.33$		Adjusted $R^2=0.30$	

PDAS: Pain Disability Assessment Scale; PVAQ: Pain Vigilance Awareness Questionnaire; NRS: Numerical Rating Scale.

DISCUSSION

We investigated the influence of hypervigilance on disability compared with other psychological factors examined. The results showed that the PVAQ and NRS were associated with disability, as measured using the PDAS. Our findings indicate that hypervigilance to pain influences disability more than other psychological factors examined.

A previous study revealed that the PVAQ score correlated with ADL score¹⁰). The present study is the first to demonstrate that hypervigilance influences disability more than other psychological factors examined by multiple regression analysis, in contrast to previous reports that used correlation analysis. The results of this study may support the fear-avoidance model, which explains that catastrophizing, fear, and anxiety of pain are related to hypervigilance, and hypervigilance is related to disability¹). Hypervigilance appears to be the most importance factor that influences disability compared with other psychological factors examined.

Several limitations of this study should be acknowledged. First, it was unclear that improvement in the PVAQ score was associated with ADL score because this was a cross-sectional study. Second, it was unclear whether the PVAQ score would be associated with ADL score in young patients with chronic pain, as the subjects of our study were elderly patients. Third, the PVAQ score may be affected by gender difference⁹), but most of the subjects were female.

In summary, we investigated the influence of hypervigilance on disability compared with other psychological factors examined. The PVAQ and NRS scores showed significant influence on disability. Thus, hypervigilance to pain influenced disability more than other psychological factors examined.

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