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ScienceDirect

Journal of Behavior, Health & Social Issues

Journal of Behavior, Health & Social Issues xxx (2018) xxx–xxx

www.journals.unam.mx/index.php/jbhsi

Original

An appraisal of the fit of a cognitive behavioural model of headache in University students☆

Evaluación del ajuste de un modelo cognitivo conductual de cefalea en estudiantes universitarios

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Received 20 May 2017; accepted 3 November 2017

Abstract

The aim of this study was to evaluate the fit of a cognitive behavioural model of headache in the population of University students, from Córdoba, Argentina. The direct and indirect contributions to pain intensity of control beliefs, beliefs and thoughts about pain and coping strategies were determined, as were the direct contributions of pain behaviours and disability. The sample was comprised of 382 students of both genders from several Universities. Multiple instruments were administered to measure the variables proposed in the cognitive behavioural model of headache followed by a descriptive and exploratory analysis of the data. Structural equation modelling was used and revealed an acceptable fit of the model but with lower levels than the criteria proposed. The model was therefore redefined by eliminating two indicators and was then found to achieve a better fit (CFI = .91; GFI = .95) and an optimal RMSEA index of .05. The new model explained 47% of the variance of headache intensity. All the variables of the model predicted pain intensity directly, with beliefs and thoughts about pain having the greatest predictive value ($\beta = 0.68$).

Keywords: Chronic pain; Headache; Cognitive behavioural model of headache; Structural equations modelling

Resumen

El objetivo de este estudio fue el de evaluar el ajuste de un modelo cognitivo conductual de cefaleas en estudiantes universitarios de Córdoba, Argentina. Se examinaron las contribuciones directas e indirectas a la intensidad del dolor de las creencias de control, creencias y pensamientos sobre el dolor y las estrategias de afrontamiento, así como las contribuciones directas de las conductas del dolor y la discapacidad. La muestra estuvo compuesta por 382 estudiantes de ambos sexos de diferentes universidades. Se administraron múltiples instrumentos para medir las variables propuestas en el modelo cognitivo-conductual de cefalea, seguido de un análisis descriptivo y exploratorio de los datos. Los análisis mediante ecuaciones estructurales indicaron un ajuste aceptable del modelo, pero con niveles inferiores a los criterios propuestos. El modelo se redefinió eliminando 2 indicadores y se observó un mejor ajuste (CFI = .91; GFI = .95) y un índice RMSEA óptimo de .05. El nuevo modelo explicó el 47% de la varianza de la cefalea. Todas las variables del modelo predijeron la intensidad del dolor, siendo las creencias y los pensamientos sobre el dolor las de mayor valor predictivo ($\beta = .68$).

Palabras clave: Dolor crónico; Cefalea; Modelo cognitivo-comportamental de cefalea; Modelo de ecuaciones estructurales

☆ Peer review under the responsibility of Asociación Mexicana de Comportamiento y Salud.

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https://doi.org/10.1016/j.jbhsi.2018.01.003

Please cite this article in press as: Moretti, L. S., et al. An appraisal of the fit of a cognitive behavioural model of headache in University students. *Journal of Behavior, Health & Social Issues*, https://doi.org/10.1016/j.jbhsi.2018.01.003

Introduction

Task force on taxonomy of the International Association for the Study of Pain (IASP) says that pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Kumar & Elavarasi, 2016). Pain experience is a result of the interaction between sensory, behavioural and affective components; it can be caused by nociception, psychological factors and learning-based behavioural phenomena. It is one of the most common causes of disability and is associated with high levels of both economical costs as well as human suffering – particularly in cases of chronic pain. For these and other reasons the study of pain is a central topic of the contemporary health sciences (Miró, 2006).

Chronic pain is a type of pain which is present throughout long periods, is persistent, does not respond to common medical treatments and which does not have an adaptive value for the individual but instead is associated with a range of disorders which incapacitate the person (Miró, 2006). This pain causes the individual to face a continuous cascade of stressors which impact through all aspects of the person's life. Bearing in mind the complexity of chronic pain, it should be studied from a multidimensional perspective (van-der Hofstadt & Quiles, 2001).

Independently of the aetiology, pain is the main symptom which compels people to seek medical attention and is the principal reason for consulting within medical practices (Pueyrredón & Salvat, 2007). Within chronic pain the most frequent types include chronic lumbalgia, myofascial pain, fibromyalgia, neuropathic pain, phantom limb pain, central pain and headache (Bonica, 1990; Goldenberg, 1987; Pueyrredón & Salvat, 2007), with the last being the most common. Headache is defined as the sensation of pain or discomfort in the head and particularly the cranium (Rodríguez-Franco, Cano-García, & Blanco-Picabia, 2004).

In the city of Córdoba, Argentina, a study examining a range of lesser health disorders in University students was carried out which found that within the sample of 315 students 72.2% reported discomfort due to headaches. Given that headaches can potentially hinder academic performance and/or be symptomatic of a range of illnesses, and given the currently high prevalence of headache in the young adults sampled in this investigation, the need to study headache further and to benefit from explicative models of this complaint is evident (Moretti, 2010a).

Fear-avoidance model

Over the years some cognitive behavioural models have been developed in which the variables *fear* and *avoidance* are presented as crucial mechanisms to explain the progression of acute pain into chronic pain (Severeijns, Vlaeyen, van den Hout, & Picavet, 2004). In 1995, Vlaeyen, Kolen-Snijders, Boeren, and van Eek (1995) proposed a refined version of Lethem's cognitive behavioural model of chronic pain (Lethem, Slade, Troup, & Bentley, 1983). This model (see Fig. 1) states that after a pain-producing lesion appears, two different responses can be generated: in the first response the pain felt is interpreted as non-threatening and is faced in an adaptive way; the person does not catastrophise but confronts the pain experience and achieves an earlier recovery. The second possibility is that the pain experience is perceived as a threat whose consequences are catastrophised by the individual (Vlaeyen & Linton, 2000). When the latter occurs feelings of fear are linked to the pain experience (Leeuw et al., 2007). *Catastrophisation* – understood as an exaggerated negative orientation towards pain – leads to avoidance behaviours (e.g. avoiding movement) and *hypervigilance* of bodily sensations and is subsequently followed by disability, disuse and depression. Consequently, the pain experience is maintained, feeding into and reinforcing the vicious cycle and increasing the fear and avoidance responses (Vlaeyen & Linton, 2000). Catastrophisation therefore is established as a precursor to pain-related fear – more specifically to the fear of moving or gaining new lesions – and is affected by negative affectivity and by threatening information regarding the illness (Sullivan, Bishop, & Pivik, 1995). From the perspective of this model, pain-related fear or fear based in the belief that a new lesion will be caused explains why some individuals recover relatively quickly from pain while other develop chronic pain. It should be noted that in the case of people with chronic pain it is not possible to avoid the pain but it is possible to avoid that the pain be perceived as threatening (Leeuw et al., 2007).

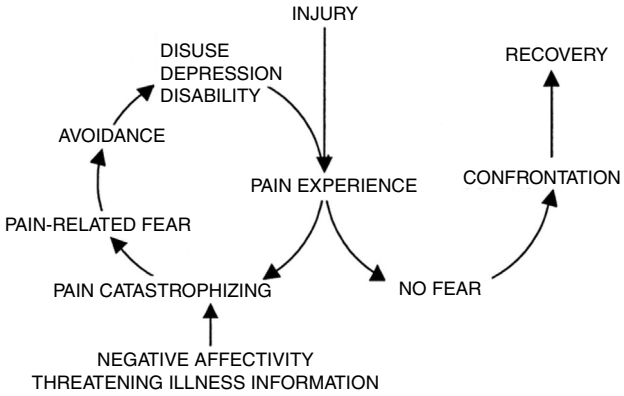

Fig. 1. Cognitive behavioural model of fear-avoidance in chronic pain (taken from Vlaeyen et al., 2007).

Criticisms of the fear-avoidance model

Despite the wide acceptance of the fear-avoidance model in the scientific community it also possesses some limitations. Firstly, Vlaeyen and Morley (2009) state that although the model has been successfully tested in cases of back and neck pain this has not occurred in cases of fibromyalgia or headache as there have only been a limited number of studies which apply the model to these conditions. Additionally, the model does not place importance on the intensity of pain despite various studies finding that intense pain is in itself an experience which produces fear and which leads to escape and avoidance. Finally, the model places fear of pain in a central position despite the existence of other factors which can determine the development of back pain, such as pain catastrophising and negative affect (see Fig. 1) (Leeuw et al., 2007).

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