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Original research

Association of glycaemia with perceived threat of illness in patients with type 2 diabetes



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ABSTRACT

Background: It is essential to reach glycaemic control in patients with diabetes mellitus to prevent reduced life expectancy and morbidity related to complications. The aim of this study was to determine whether glycaemic control is associated with the perception of illness in type II diabetes mellitus. **Methodology:** Illness perception was assessed in a sample of 242 diabetics attending a Family Health Centre in Chile using the Brief Illness Perception Questionnaire (BIPQ). We considered well-controlled individuals to have glycated haemoglobin below 7%, and we assessed association with the BIPQ score. The data were analysed by logistic regression.

Results: The total BIPQ score was significantly higher (more negative perception) in non-controlled individuals; the most significant differences were found in the following dimensions: consequences ($p = 0.0003$), personal control ($p = 0.0392$), identity ($p = 0.0006$) and emotional affection ($p = 0.018$). The dimensions of timeline, treatment control, concern and coherence showed no differences between the groups. The mean age of well-controlled subjects was significantly higher than the age of non-controlled diabetics. Well-controlled patients had been diagnosed with diabetes for significantly fewer years than had those that were not.

Conclusions: Perceiving illness as more negative (BIPQ score >37) is highly associated with being a non-controlled diabetic, with more consequences over their daily life, less control over the disease and a higher number of attributable symptoms. When control variables are

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considered, a negative perception of diabetes has an adjusted OR of 2.14 (CI 95% 1.17–3.92) to have glycated haemoglobin above 7%.

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1. Introduction

In spite of efforts made throughout the world, diabetes continues to be a disease with both short and long-term complications. The evidence shows that adherence to treatment is below 50% in developed countries [1,2]. So far, primary care teams have few universal strategies to improve adherence and outcomes, while the incidence and the rate of complications keep rising [3].

Chronic diseases as diabetes constitute a permanent challenge for both the health care provider and the patients. People exhibit a wide variety of ways to cope with their health threats, and personal beliefs seem to be associated with the degree of control they have over their illness [4–6]. The degree to which patients follow advice is determined by their health beliefs (Illness Representations or Personal Models), and treatment outcomes depend upon many variables closely related to habits in the case of chronic diseases, where the results depend to a great extent upon human behaviour [6–8].

The common-sense model (CSM) of self-regulation for health and illness was formulated 30 years ago by Leventhal, and proposes that the patient is an active subject who elaborates a parallel processing of both cognitive and emotional representations of his/her illness or health threat [9]. Therefore, subjects make decisions, adopt behaviours and cope with responses that are closely related to this representation, upholding the results of their behaviour [10]. Cognitive representations are considered in five central dimensions: identity, consequences, cause, timeline and control/cure [9]; *identity* is a label about the importance and symptoms the patients assign to their own illness; *consequences* are the outcomes and effects the patients expect as a result of their illness; *cause* is the causal attribution that the patients assign to their illness; *timeline* are the beliefs about the course of the illness and its expected duration; and *cure or control* is the extent to which patients believe they can recover from or control their disease [9]. Emotional representations of illness include negative reactions, such as anger, fear and distress.

The organised model was proposed based on three main constructs: the previously mentioned representations of the experience of being chronically ill, the responses and coping efforts, and the appraisal of the outcome of these efforts [11].

Since Leventhal formulated his model in 1984, different illness perception questionnaires have been available to assess different domains of the construct, with the goal to study associations between illness perceptions, health outcomes, and other psychological results, such as coping, mood, and functional adaptation [10,12–14].

The Illness Perception Questionnaire (IPQ) was developed to explore cognitive representations [12]. Later, a revised version, the Illness Perception Questionnaire Revised (IPQ-R), distinguished *timeline* dimension in *acute/chronical* and

cyclical, and *control/cure*, in *personal control* and *treatment control* [15]. It also included the *emotional representations*. More recently, a short version was created, the Brief Illness Perception Questionnaire (BIPQ) [16]. These instruments have demonstrated to have appropriate psychometric properties and have been translated and validated to different languages, and administered to populations with different chronic illnesses, including diabetes [7,14,17]. However, no studies have yet been carried out in South America using the validated BIPQ to assess illness perception in local diabetic patients. Moreover, information concerning associations between illness perception and glycaemic control in diabetic patients is scarce and contradictory.

The main objective of this cross-sectional study was to determine if diabetic patients with a more serious representation of their illness, have a worse glycaemic control measured across their levels of glycosylated haemoglobin (HbA1c), than those who have a less serious representation of illness, as assessed by BIPQ, in a sample of Chilean patients.

2. Patients and methods

This was an observational, analytical, cross-sectional study designed to study illness perceptions in a sample of diabetic patients attending a primary care Family Centre located at Gómez Carreño, a neighbourhood in the city of Viña del Mar, Chile. We administered the BIPQ, a nine-item test designed to assess the patients' cognitive and emotional representations of disease on 0–10 Likert-like scales [12,15,16]. The eight items considered in this study were: 1. *consequences*—the effects and outcomes the patient expects as a consequence of his/her illness; 2. *timeline*—the course and duration the patient thinks his/her illness will have; 3. *personal control*—self-efficacy beliefs, the extent to which the patient believes that they can recover from or control the illness; 4. *treatment control*—the extent to which the patients believe that the treatment may control their illness; 5. *identity*—the particular label the patient uses to describe what symptoms he/she perceives as part of the illness; 6. *concern*—the emotional representation of the level of worry the illness generates; 7. *understanding or coherence*—the overall comprehension of illness factor; 8. *emotional representation*—assessment of the emotional responses generated by the illness [9] [15,16]. Item 9 of BIPQ is an open question which was not considered in this study. The overall score is calculated by adding up items 1, 2, 5, 6 and 8 with the reverse scores of items 3, 4 and 7 [12,15–17]. As a result, the higher the BIPQ overall score, the more serious the perception the patient has about the health threat his/her illness represents.

Sample size was calculated for a mean-comparison test of BIPQ score, with a two-tail hypothesis, 80% power and a level of significance alpha below .05. Considering *personal control* as

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