



Research paper

When knowing is not enough: Emotional distress and depression reduce the positive effects of health literacy on diabetes self-management



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ABSTRACT

Objectives: Adequate self-management activities are important predictors of diabetes outcomes. As diabetes literacy and self-efficacy are strong predictors of diabetes self-care, self-management education programs focus essentially on these factors. This study investigated whether emotional distress or depression moderates the relation between health literacy, self-efficacy and diabetes self-care behaviors. **Methods:** 128 people with type 2 diabetes were recruited in hospitals, through general practitioners and via a diabetes website, and completed a questionnaire assessing health literacy, self-efficacy, diabetes-related distress, depression and self-care behaviors.

Results: Multiple regression analysis confirms that health literacy and self-efficacy significantly predict reported self-care behaviors. Additional regression analyses reveal that distress or depression do not predict self-care behaviors directly, but moderate the effect of health literacy, which has a weaker impact in patients experiencing distress or depression. In contrast, distress and depression do not moderate the effect of self-efficacy on diabetes self-care behaviors.

Conclusion: Emotional distress, whether related to diabetes or not, prevents patients from acting on their competence to perform adequate self-management behaviors.

Practice implications: Diabetes Professionals should pay more attention to the patients' affective state and its influence on self-care. Psychological support should be integrated in the care for people suffering from type 2 diabetes.

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1. Introduction

Early diagnosis and appropriate management of type 2 diabetes significantly increase the chances of preventing harmful and costly complications. Therefore, the care for patients with diabetes focuses strongly on disease management. Because managing diabetes requires extensive self-care, the capacities of patients to manage their own illness and care process are considered to be a key determinant of treatment outcomes [1]. The practice guide of the American Association of Diabetes Educators [2] specifies seven self-care behaviors that are essential for people with diabetes: (a) healthy eating, (b) being active, (c) blood glucose monitoring, (d) taking medication, (e) problem

solving (e.g. when there is an obstacle to dietary compliance), (f) healthy coping (e.g. speaking with friends or playing music to deal with stress), and (g) changing behaviors that increase the risk of developing diabetes complications (such as smoking or alcohol consumption).

The patient's adherence to the above-mentioned self-care behaviors is critical to achieve better glycemic control and, thereby, avoid complications associated to a poor diabetes control [3,4]. Understanding the factors that influence adherence is therefore of utmost importance. As appears from the literature, a patient's adherence to the treatment is affected by several factors, both at the patient level (e.g. health literacy, self-efficacy) and at the provider or service level (e.g. organization of health services, communication skills). The current paper focuses on three individual factors that may impact on self-care behaviors for diabetes, i.e., health literacy, self-efficacy, and emotional distress. Recent studies have demonstrated the impact of these factors on self-care behaviors separately, but to our knowledge, none has examined the potential interactions between them. This study

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investigates whether emotional distress can moderate the relationship between health literacy or self-efficacy on diabetes self-care behaviors.

Health literacy is defined as “a person’s knowledge and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course.” [5,6]. It is well established that a low level of health literacy leads to poorer health outcomes, greater use of health care services, poorer adherence to medication, and poorer self-care behaviors [7]. As the treatment of diabetes requires the patient to seek information, take health-related decisions, and understand medical instructions, health literacy is highly relevant for diabetes treatment [8]. Lower levels of health literacy have indeed been associated with poorer knowledge about diabetes and poor glycemic control [5,6], which increases the risk of developing diabetes-related complications like retinopathy [9–11].

Self-efficacy is defined as a person’s beliefs about his or her capacities to complete tasks and reach goals. These beliefs, whether justified or not, influence a person’s choices, goals, and motivation to engage in behavior to reach these goals [12,13]. The concept of self-efficacy has been integrated in several theoretical models that explain and predict health-related behaviors, such as the Protection Motivation Theory [14] and the Theory of Planned Behavior [15]. In the context of diabetes self-management, it was shown that a strong sense of self-efficacy is related to higher glycemic control and self-care behaviors [16] and to a better adherence to the medical treatment [17].

While health literacy and self-efficacy are cognitive constructs, the management of diabetes is also related to emotional factors. The fact of being diagnosed with diabetes can be a big challenge for the patient. In addition, the treatment of the illness requires a great adaptation, as the newly diagnosed patient has to learn to self-manage his(her) illness at all times and in all situations [9]. Therefore, patients with diabetes are likely to experience a range of emotions regarding their treatment and the possible risk of complications, such as feeling stressed or defeated by the disease, feeling it controls their life, worrying about their capacity to self-manage their diabetes, losing their motivation, avoiding tasks that could give negative feedback of their self-management capacity, and feeling alone to face the disease [9]. This range of emotions is referred to as “diabetes-related distress” [18]. The prevalence of distress is higher among patients who are treated with insulin injections [19] and among younger patients [20]. It has been demonstrated that emotional distress in diabetes is related to poorer adherence and poorer self-management [21], but it remains unclear whether distress is the cause or consequence of these outcomes. Patient who feel distressed are also less willing to perform self-care activities, which can lead to higher levels of glycated hemoglobin [22] and higher risk of mortality [23].

In addition to distress, diabetes patients are also vulnerable to develop clinical depression. Based on a meta-analysis, Anderson and co-workers [24] estimated that 31% of patients with diabetes had symptoms of depression and 11% major depression. In controlled studies indicated by these authors, the proportion of people who reported depression was twice as high in the diabetes group compared to the comparison group [24]. Three reasons may underlie this high prevalence: firstly, diabetes entails a number of restrictions and constraints, which may be a source of depression. Secondly, depressive people are more at risk for developing diabetes because of poor lifestyle habits (e.g., physical inactivity, high-fat diet, smoking, alcohol consumption, . . .) or metabolic disturbances [25]. Finally, the depression and diabetes may both be the effect of a third variable, notably overweight, as overweight

people are more at risk to develop both depression and diabetes [26].

Whereas the impact of health literacy, self-efficacy, emotional distress and depression on adherence to diabetes treatment have been demonstrated independently, no studies have been performed to date which considered these factors simultaneously. As a result, it is not known to what extent these cognitive and emotional processes interact. The present study attempts to fill this gap by investigating whether the impact of patients’ health literacy and self-efficacy beliefs on their self-care behaviors is moderated by diabetes-related distress and depression. Specifically, we hypothesized that distress and/or depression would attenuate/eliminate the positive effect of health literacy and self-efficacy on diabetes self-care behavior by preventing the patient from using his (her) cognitive resources to manage the disease and treatment.

2. Methods

2.1. Recruitment and data collection procedure

Participants were patients with Type 2 diabetes mellitus who were recruited from 7 different sources: two hospitals, two diabetes centers, two general practices, and the Belgian Diabetes Association. Only patients with Type 2 diabetes (80% of diabetes cases (27)) were included in the study.

Data collection was performed between August 2014 and March 2015 and involved the distribution of a questionnaire in two ways: (1) a paper version of the questionnaire was handed to the patients from the collaborating hospitals, diabetes centers, and general practices, to be completed at home and returned to the researchers in a pre-stamped envelope; (2) an online version of the questionnaire was made available via a web-link placed on the website of the Belgian Diabetes Association [27]. In total, 409 paper questionnaires were distributed: 197 in the two hospitals; 160 in the diabetes centers, and 52 in the general practices.

Ethical approval was obtained from the ethical committees of the participating hospitals (P2014/256). Each participant provided informed consent in writing.

2.2. Evaluation instruments

Self-care behaviors were assessed by means of the Diabetes Self-Management Questionnaire (DSMQ) [28], which contains 16 items in the form of self-management activities (e.g. *I do regular physical activity to achieve optimal blood sugar levels; I keep all doctors’ appointments recommended for my diabetes treatment*; etc.) to be scored on a 4-point Likert scale ranging between “does not apply to me” to “strongly applies to me”. The questionnaire yields scores on 4 sub-scales: “glucose management” (GM), “dietary control” (DC), “physical activity” (PA), and “health-care use” (HU), as well as a “sum scale” (SS). In this study, the questionnaire shows an acceptable level of internal consistency ($\alpha = 0.719$).

Two questionnaires were used to assess health literacy. General health literacy was measured via the 6-item version of the European Health Literacy Survey Questionnaire (HLS-EU-Q6) [29], which produces a mean score ranging from 1 to 4. Participants who score less than 2 are considered to have an insufficient level of health literacy; those who score between 2 and 3 have a limited level of health literacy; and those who score more than 3 are considered to be sufficiently health literate. The HLS-EU-Q6 shows very strong correlations with both the full version HLS-EU-Q47 and the 16-item shorter version HLS-EU-Q16 [30]. The internal consistency of this scale in our sample is adequate ($\alpha = 0.797$). Diabetes-specific health literacy was

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