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THE EVALUATION OF KNOWLEDGE LEVEL AND MOTIVATIONAL COMPONENTS IN PATIENTS WITH DIABETES AND THEIR RELATIONSHIP TO GLYCEMIC CONTROL

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Abstract
Diabetes is a disease often associated with secondary morbidity and mortality. Patients with diabetes are at increased risk for complications of the disease. Many of these complications can be prevented by an appropriate diabetes management. The study examines the knowledge level and motivational profile of people with diabetes. The study sample consists of 167 (N = 167) of type 2 diabetic participants. The patients were asked to complete the following questionnaires: Diabetic Knowledge Questionnaire (DKQ -24) and the Self-Determination Theory Questionnaire Packet for Diabetes (TSRQ -D, PCDS, HCCQ - D). The results show that there is no significant negative association between knowledge of diabetes and glycemic control (HbA1c), moreover the data showed no association between glycemic control and knowledge. The results show a strong association between diabetes-related knowledge and autonomy index. We assume that the disease knowledge alone is not enough to manage the glycemic control without appropriate motivation dimensions. This needs further investigations.

Keywords: type 2 diabetes, glycemic control, motivation, autonomy and diabetes-related knowledge

1. INTRODUCTION

Patients with diabetes are at increased risk for complications of the disease. Many of these complications can be prevented by an appropriate treatment. This treatment requires, in most cases, considerable changes in lifestyle and regularly performing certain tasks of self-management (e.g., checking their blood sugar, adjusting insulin doses based on the food they eat).

The greatest weapon in the fight against diabetes is knowledge. An informed patient is better suited to the disease, being able to better understand the disease and its symptoms.

There are studies with evidence that people affected with the disease complications often have inadequate knowledge about the nature of diabetes, of risk factors and associated complications (Jabbar, Contractor, Ebrahim, Mahmood, 2001; Kamel, Badawy, el-Zeiny, Merdan, 2000; Sivaganam, Namasiyavam, Rajasekaran, & Thirumalaikolundusubramanian, 2002) and that the lack of awareness can be the basic factor affecting attitudes and practices towards its care. McPerson et al's study (McPherson, Weiss, Powers, & Zuckerman, 2008) found a strong inverse association between the knowledge level and the Hb1Ac (glucose metabolism). Another study, Arora et al. (Arora, Marzec, Gates, Mechine, 2011), found no association between knowledge and glycemic control, only disease duration and level of education reached statistical significance. Previous studies on the relationship between diabetes-related knowledge and diabetes outcomes have reported conflicting results.

Knowledge alone does not always result appropriate behavior of diabetes self-management that can lead to good metabolic control.

Self-determination theory is a macro-theory of human motivation and personality that assumes that humans are innately motivated toward health and wellbeing (Deci & Ryan, 2000). The self-determination theory (SDT) is an excellent model for understanding chronic disease management (Williams et al., 2004); based on previous empirical results we can observe a positive association between patient autonomy and health (Ng, Ntoumanis, Thøgersen-Ntoumanis, Deci, Ryan, Duda, & Williams, 2012). According to self-determination theory, the three basic psychological needs for autonomy, competence, and relationship are universal, but the satisfaction of any

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basic need may differ from one culture to another (Deci, & Ryan, 2000). There is evidence that these basic psychological needs are indeed universal (Chirkov, Ryan and Willness, 2005).

This model may be helpful in the structuring of the systems of care to improve the outcomes (Williams, McGregor, Zeldman, Freedman, & Deci, 2004).

1.1. Objectives

The study examines the knowledge level and motivational profile of people with diabetes reported to glycemic control. The study seeks the answer to the question whether in the knowledge of diabetes and of motivational profile can be identified differences between diabetics in relation to the quality of glucose metabolism, so that we can define some characteristic group sizes needed for a proper self-care.

2. METHOD AND PROCEDURE

2.1. Participants

The study sample consists of 167 (N = 167) of type 2 diabetic participants. Subjects will be divided into two subgroups, depending on glycemic control, homogeneous by age, sex and education. Of type 2 diabetes evaluated, 80 (47.9 %) are with balanced diabetes, with good glycemic control and 87 (52.1 %) are with unbalanced diabetes, with an inadequate glycemic control. The selection criterion was the level of glycosylated hemoglobin (HbA1c), classified as follows: 80 adults with balanced diabetes mellitus (good glycemic control, HbA1c <7%) and 87 adults with unbalanced diabetes mellitus (inadequate glycemic control, HbA1c >7%).

2.2. Instruments

Participants were asked to provide biographical data and medical history of diabetes and with the consent of patients from family medicine cabinets we have collected from medical records last known values for glycosylated hemoglobin (HbA1c). In the next step the patients were asked to complete the following questionnaires: Diabetic Knowledge Questionnaire (DKQ -24) and the Self- Determination Theory Questionnaire Packet for Diabetes (TSRQ –D: autonomy, PCDS: perceived competence, HCCQ – D: autonomy support).

2.3. Data processing

Data collection was followed by their introduction into the database. Statistical data processing was performed using SPSS (Statistical Package for the Social Sciences) version 20.0.

3. RESULTS

3.1. The level of knowledge of diabetes vs. glycemic control

The results show that there is no significant negative association between knowledge of diabetes and glycemic control (HbA1c) (r = -.14, p =.06). Between the knowledge level and the duration of illness there is a significant negative association (r = -.19, p =.014).

Pearson correlation indices show a tendency of association between knowledge and level of education (r =.16, p =.03) and we identified a positive association between the duration of the disease and HbA1c (r =.20, p =.009).

The analyzes revealed the important role in our sample of duration of the disease and education, both showing a significant negative association with diabetes-related knowledge. The results showed two significant patterns. The model with variable of the disease duration was a significant negative predictor of diabetes-related knowledge (β = -0.190, p =.014) but explained only 4% of their variance (R2 =.036, F(1.165)=6.18, p =.014). The model including the two factors, respectively the disease duration and the level of education, explained the most of the variance in knowledge, respective 7% (R2=.069, F(1.165)=6.08, p =.003). Among the variables included in the model, the disease duration had a higher explicative power (β = -0.207, p =.007) compared to the level of education (β = 0.182, p =.017), the contribution of duration of illness being greater.
Although the data showed no association between glycemic control and knowledge, but the t test results suggest that there are however significant differences between the two groups after glycemic control on knowledge variable (t(156.44) = 2.327, p = .021).

3.2. Motivation vs. glycemic control

The obtained results support the fact that glycemic control is associated with some of the evaluated motivational components. To determine the optimal model of predictors for glycemic control in type 2 diabetes group, we performed standard multiple regression analyses, all significantly correlated variables with glycemic control with predictors role (perceived competence, autonomy and disease duration) being included step by step in the equation.

The results showed two significant patterns. In the sample, the model with the variable of perceived competence was a significant predictor of glycemic control (β = -0.339, p = .00) explaining 12% of their variance (R² = .115, F(1.165) = 21.49, p = .00). The model including the two factors, namely perceived competence and autonomy explained most of the variance in glycemic control, respective 16% (R² = .16, F(1.165) = 15.59, p = .00). Among the variables included in the model, a greater explanatory power had perceived competence (β = -0.270, p = .00) compared to the autonomy (β = 0.222, p = .004), the contribution of the perceived competence being higher. In the model including all three variables, the disease duration did not result as a significant predictor of glycemic control.

To test the SDT model of health in patients with type 2 diabetes mellitus, in Romania, we performed linear regression analyses between variables of motivation (autonomy, perceived competence, social support). Performed regression analyzes also showed that the autonomy support was a significant predictor of perceived competence (β = 0.338, p = .00) explaining 12% of its variance (R² = .115, F(1.165) = 21.34, p = .00), the perceived competence being a significant predictor of the autonomy (β = 0.313, p = .00) explaining 10% of its variance (R² = .098, F(1.165) = 17.96, p = .00) and also a negative predictor of glycemic control (β = -0.339, p = .00) explaining 12% of its variance (R² = .115, F(1.165) = 21.49, p = .00) . The autonomy is a significant negative predictor of glycemic control (β = -0.307, p = .00), explaining relatively little of its variance, 9% (R² = .094, F(1.165) = 17.14, p = .00).

The original model has three components that mediate disease self-management, or glycemic control as measured by HbA1c (relationship → autonomy → competence → glycemic control). To the model for patients with type 2 diabetes from Romania, the order of the two components, namely autonomy and competence are reversed (relationship → competence → autonomy → glycemic control).

3.3. The association between diabetes-related knowledge, motivational components and their relation to glycemic control

The results show a strong association between diabetes-related knowledge and autonomy index (r = .29, p = .00), but we did not find any association between the other motivational variables and knowledge.

The results showed that in our sample, the knowledge of diabetes was a significant positive predictor of autonomy (β = 0.292, p = .00) but explaining only 9% of its variance (R² = .085, F(1.65) = 15.38, p = .00).

Figure 1 shows the optimal model for predictors of glycemic control in type 2 diabetes sample.
4. DISCUSSIONS AND CONCLUSIONS OF THE STUDY

The study investigated the level of knowledge in patients with diabetes and the relation to glycemic control, the duration of diabetes and the level of education. We found that the metabolic control is not associated with knowledge about diabetes, increasing the educational camp according to which the knowledge does not always lead to changes in behavior (Formosa, Vella, 2012).

We investigated the motivational profile after SDT theory (autonomy, competence, autonomy support) of the persons with diabetes (type 2). Our data do not fit in all respects to those of the original model from the U.S., being unable to reproduce the exact structure of the original model. Therefore, the autonomy support is predictive of the perceived competence and competence is predictive of the perceived autonomy, while autonomy is predictive of glycemic control.

In the last stage, we investigated the inter-relationship between knowledge related to diabetes and motivational profile of people with diabetes in relation to glycemic control, based on previous studies (e.g. Wint et al. 2006) which revealed that inadequate knowledge and motivational factors are significant barriers to good glycemic control. To the sample with type 2 diabetes, the results revealed several tendencies of association. The level of knowledge related to diabetes being correlated with the index in the positive range, in order to determine the prediction model we conducted analyses of linear regression between the two variables. The results showed that in our sample the levels of knowledge of diabetes were significant positive predictors of autonomy.

We assume that the disease knowledge alone is not enough to manage the glycemic control without appropriate motivation dimensions. This needs further investigations.
5. REFERENCES


