

Locus of control in health and self-esteem in type-2 diabetic patients

LÓCUS DE CONTROLE EM SAÚDE E AUTOESTIMA EM PORTADORES DE DIABETES MELLITUS TIPO 2

LOCUS DE CONTROL EN SALUD Y AUTOESTIMA EN PACIENTES DE DIABETES MELLITUS TIPO 2

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ABSTRACT

The objective of this study was to relate the scores obtained with the application of the scales of locus of control of health and self esteem with socio-demographic and clinical variables, risk factors and chronic complications in 65 patients with type-2 diabetes mellitus. This is a descriptive cross-sectional study. Statistical analysis was performed using Pearson's chi-square, Mann-Whitney, Kruskal-Wallis, and Spearman's Correlations tests. Regarding the locus of control, in average, patients presented higher scores in the internal dimension, and women showed more externality-at random for health. Statistically significant relationships were found between internality with time of diagnosis and physical activity; between externality-other powerful entities with glycated hemoglobin and physical activity; and between externality-at random with practice of physical activity. Most individuals has high self-esteem, but no variable was statistically related.

DESCRIPTORS

Diabetes mellitus, type 2
Scales
Control
Self-concept

RESUMO

O presente estudo teve como objetivo relacionar os escores obtidos pela aplicação das escalas de locus de controle da saúde e autoestima com variáveis sócio-demográficas, clínicas, fatores de risco e complicações crônicas em 65 portadores de diabetes mellitus do tipo 2. Trata-se de um estudo descritivo transversal onde foram utilizados, para a análise estatística, os testes de Qui-quadrado de Pearson, Mann-Whitney, Kruskal-Wallis e de Correlação de Spearman. Em relação ao locus de controle, os pacientes apresentaram, em média, maiores escores na dimensão interna, sendo que as mulheres demonstraram maior externalidade-ao acaso para a saúde. Relações estatisticamente significativas foram encontradas entre internabilidade com tempo de diagnóstico e atividade física; entre externalidade-outras poderosas com hemoglobina glicada e atividade física e entre externalidade-ao acaso com a prática de atividade física. A autoestima foi alta na maioria dos indivíduos, porém não se relacionou estatisticamente a nenhuma variável.

DESCRIPTORIOS

Diabetes mellitus tipo 2
Escala
Controle
Autoimagem

RESUMEN

El estudio objetivó relacionar los puntajes obtenidos por aplicación de escalas de locus de control de salud y autoestima con variables sociodemográficas, clínicas, factores de riesgo y complicaciones crónicas en 65 pacientes de diabetes mellitus tipo 2. Estudio descriptivo transversal, fueron utilizados para el análisis estadístico las pruebas de Qui-cuadrado de Pearson, Mann-Whitney, Kruskal-Wallis y de Correlación de Spearman. En relación al locus de control, los pacientes presentaron en promedio mayores puntajes en la dimensión interna, siendo las mujeres quienes demostraron mayor externalidad al acaso para la salud. Relaciones estadísticamente significativas fueron encontradas entre internabilidad con tiempo de diagnóstico y actividad física, entre externalidad-otros poderosos con hemoglobina glicosilada y actividad física y entre externalidad al acaso con práctica de actividad física. La autoestima fue alta en la mayoría de los individuos, sin embargo no se relacionó estadísticamente a ninguna variable.

DESCRIPTORIOS

Diabetes mellitus tipo 2
Escala
Control
Autoimagen.

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INTRODUCTION

Diabetes mellitus is a non-transmissible chronic disease, the prevalence of which is growing in Brazil and worldwide, becoming a severe public health problem⁽¹⁾. The disease is characterized by chronic hyperglycemia that results from a reduced or complete lack of production of insulin by the pancreas and/or peripheral resistance to the action of insulin⁽²⁾.

The disease's etiological classification is defined in four subgroups: type 1 Diabetes Mellitus (DM1), type 2 Diabetes Mellitus (DM2), other types of diabetes and Gestational Diabetes Mellitus⁽³⁻⁴⁾.

DM2 manifests slowly and progressively and generally occurs in adults, when it is referred to as latent autoimmune diabetes⁽⁴⁾. In general it results from variable degrees of insulin resistance and a relative deficiency of insulin secretion⁽²⁾. Most patients are overweight⁽³⁾. The diagnosis is achieved after individuals reach 40 years of age in 85% to 90% of the cases, though it may occur earlier and rarely in adolescents⁽⁴⁾. Poor glycemic control over the course of life triggers the onset and worsening of chronic complications that include macroangiopathy, microangiopathy and peripheral and autonomic neuropathies.

Appropriate glycemic and blood pressure control reduces medical and social risks, avoiding a high rate of hospitalization and future complications such as cerebrovascular, coronary artery and peripheral vascular diseases, heart failure, ischemic heart disease, chronic renal failure and stroke⁽⁵⁻⁶⁾.

Maintaining appropriate metabolic control throughout life is not an easy task because diabetes is an unpredictable disease and each person responds differently to treatment⁽⁷⁾. Health education in diabetes is an important resource to control the disease but does not ensure nor always contributes to the improvement of patients' glycemic levels⁽⁸⁾. Teaching individuals to live with a chronic disease implies assessing psychosocial aspects (beliefs, self-efficacy, locus of control, self-esteem, readiness to change, among others) in the search of social support, in addition to teaching coping strategies necessary for managing diabetes in all its varied situations.

Among the psychosocial aspects involved in the management of chronic diseases, the construct 'locus of control' has been studied for many years. The study of locus of control was initially developed by Rotter in the 1950s within the social learning theory. The author states that the probability of a specific behavior to occur in a given situation is a function of one's expectation that such behavior will lead to obtainment of a reinforcement (behavioral stimulus) and the value the individual attributes to such reinforcement.

Locus of control is a dynamic concept that explains and describes more or less stable beliefs, based on which the individual establishes the source of control of events and his/her own behavior⁽⁹⁾.

These include external sources/luck, external sources/others and internal sources. Based on the social learning process, individuals become capable of perceiving the source of origin and control of events they experience. This perception is called locus of control⁽⁹⁾.

When one does not perceive reinforcement as being associated with one's own actions, reinforcement is then attributed to chance, luck, fate or otherwise seen to depend on the power of others or is unpredictable given the great complexity of factors involved. When individuals interpret events in such a way, there is a belief in external control. When individuals perceive events (reinforcements) as associated with their own behavior or dependent on their own stable characteristics, there is a belief in internal control⁽¹⁰⁾.

The concept of locus of control was applied in the health field in the 1990s by Wallston, who developed instruments to evaluate to what extent individuals conceived of their health condition or disease being controlled by themselves, fate, or others.

The construct of locus of control is conceived as a multi-dimensional variable. External beliefs can be divided into chance expectations (reinforcement would be determined by luck or fate) and expectations that reinforcement depends on the actions of *powerful others* (such as family, professors, or physicians). Individuals who believe that powerful others control their lives may act differently from those who believe that events in their lives occur in a chaotic and unpredictable manner⁽¹¹⁾.

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In relation to other psychosocial aspects, in clinical practice it is observed that self-confident patients are more easily convinced to adopt healthy behavior. Self-esteem is considered an association between self-confidence and self-respect and reflects on the individual's ability to understand and deal with challenges and is revealed through feelings and behavior. Identifying such characteristics in DM patients may clarify to the health team the extent to which an individual is prepared to deal with the diagnosis and treatment of a degenerative and incurable disease. Information concerning the self-esteem of patients may become a tool for the team to implement education on diabetes, since the treatment is mainly implemented by patients themselves⁽¹³⁾.

Studies addressing health-related locus of control and the self-esteem of DM patients are not currently found, which justifies the implementation of this study. This study intends not only to relate the clinical characteristics of DM

patients but also to take into account the subjective element of managing the disease. Identification of health-related locus of control and self-esteem may become essential tools to guide health actions directed to DM patients in order to provide important support for a better understanding of the psychosocial factors involved in the difficulties faced during the management of this chronic disease.

OBJECTIVES

- Verify health-related locus of control and self-esteem in DM2 patients;
- Evaluate the relationships among socio-demographic, clinical, risk factors and DM2 chronic complications and the scores obtained on the locus of control and self-esteem scales.

METHOD

This cross-sectional descriptive study was conducted at the League of Diabetes Control Endocrinology Outpatient Clinic of the Hospital das Clínicas, University of São Paulo, Medical School. A convenience sample composed of 65 DM2 patients undergoing treatment was interviewed from April to August 2005.

The following variables were analyzed:

- Socio-demographic: age, gender, marital status, schooling and occupation.
- Clinical and Risk Factors: time of diagnosis, treatment (diet, oral medication, medication by injection), results from the latest glycated hemoglobin exam, smoking, alcohol, exercise, body mass index (BMI), presence of hypertension and dyslipidemia.
- DM chronic complications: macro and microangiopathic complications.
- Psychosocial variables measured through the three dimensions of the health locus of control and self-esteem scales.

This study's data were collected using three instruments. The first is a form addressing socio-demographic and clinical information, risk factors and chronic complications. The second instrument was the *Multidimensional Health Locus of Control Scale* (MHLC), translated and validated for Portuguese⁽⁹⁾. The instrument validation, after its application in four samples, was verified by its reliability (internal consistency) through Cronbach's alpha with the following values for the subscales: *internal* from 0.62 to 0.71; *external-chance* 0.51 to 0.78; and *external-powerful others* from 0.62 to 0.67. The scale is composed of these three subscales and each contains six items that refer to the dimensions: *internal* (items 1, 6, 8, 12, 13 and 17), whose scores record the extent to which the individual believes s/he is the one controlling her/his health state;

powerful other-external (items 3, 5, 7, 10, 14 and 18) whose scores records the extent to which the individual believes other people or entities (physician, nurse, friend, family member, God, etc) control her/his health condition; and 'external-chance' (items 2, 4, 9, 11, 15 and 16), whose scores indicate the extent to which the individual believes her/his health is controlled by chance, without the interference of other people or him/herself⁽⁹⁾. Scores from each dimension range from 1 to 5: totally agree (5), partially agree (4), undecided (3), partially disagree (2) totally disagree (1). The score obtained from the dimensions is the sum of items in that subscale. The sum of the values of the items belonging to each of the three subscales represent the total scores in relation to that dimension of health locus. The total score obtained in each subscale ranges from 6 and 30: the higher the score, the higher the belief in that specific dimension. The scale is presented as a single document and subscales items are intercalated⁽⁹⁾.

The third instrument was the *Feeling of Self-esteem Scale* created from a set of items that originated from several scales traditionally used for measuring self-esteem. This scale, after statistical treatment, gave origin to a final version composed of 15 items that presented the highest correlation coefficients and that was best adapted to the author's objective for the study⁽¹⁴⁾. Responses to the instrument consist of *agree* and *disagree* for each statement. A score of *one* is attributed to the answer *agree* and *zero* is attributed to the answer *disagree*. Scores are summed and the maximum possible score is 15 while the minimum possible score is zero. The higher the score is, the higher the feeling of self-esteem.

The researcher herself collected data using these instruments from patients with consultations scheduled for the dates of collection, before and after appointments. Clinical data were obtained from the patients' medical files.

Free and informed consent forms were read and signed by the participants. The researchers made the commitment to return the analyzed results to the participants and to the involved institution. The project was approved by the Research Ethics Committee at the University of São Paulo, Nursing School.

The following statistical tests were used in data analysis: Person's Chi-square test was used for obtaining absolute (N) and relative (%) frequencies, which determined that the distribution deviated from 5%, specifically, $p \leq 0.05$. Comparison between the two groups was carried out through the Mann-Whitney test while the Kruskal-Wallis test was used when there were more than two groups. For the continuous and semi-continuous variables Spearman's correlation test was employed.

RESULTS

The socio-demographic characteristics of the study sample are presented in Table 1.

Table 1 - Socio-demographic characteristics of the study sample - São Paulo - 2005

Characteristics	N(%)
Age	
Average (SD)	61(10.6)
Gender	
Male	24(37)
Female	41(63)
Marital Status	
Married	40(61.5)
Widowed	10(15.4)
Divorced	1(1.6)
Single	14(21.5)
Schooling	
Illiterate	6(9.2)
Incomplete primary school	36(55.4)
Complete primary school	8(12.4)
Incomplete secondary school	3(4.6)
Complete secondary school	6(9.2)
Bachelor's degree	6(9.2)
Paid job	
Yes	43(66.2)
No	22(33.8)
Family income	
0 to 3 times the minimum wage	29(44.6)
4 to 7 times the minimum wage	14(21.6)
More than 10 times the minimum wage	4(6.1)
Ignored	18(27.7)

Life habits and risk factors that can influence the health state of individuals such as smoking, alcohol, exercise and the intensity of exercise were also verified. As observed in Table 2, most of the individuals did not smoke or drink alcohol. Most individuals did not exercise, though an expressive percentage practiced mild exercise (about 30 minutes daily). In addition to DM, (49/75) of the participants also had systemic hypertension and 39/60 had dyslipidemia; (34/52) of the patients had chronic complications due to the disease; the frequency of macroangiopathy was 26.1% and microangiopathy was 38.4%.

The possible scores for the self-esteem scale range from 0 to 15. The higher the score is, the higher the indi-

Table 2 - Clinical characteristics of the study sample - São Paulo - 2005

Characteristics	N(%)
Time of diagnosis	
0 to 10 years	24(36.9)
11 to 20 years	27(41.6)
>20 years	22(21.5)
Treatment	
Diet	1(1.5)
Oral medication	30(46.1)
Insulin	1(1.5)
Oral medication and insulin	33(50.7)
HbA1c	
Average (SD)	8.4(9.5)
Smoking	
No	60(92.4)
Yes	5(7.6)
Alcohol	
No	4(6.2)
Yes	61(93.8)
Exercise	
No	31(47.7)
Mild	28(43.1)
Moderate	6(9.2)
IMC	
Average (SD)	27(4.4)
Hypertension	
No	16(24.6)
Yes	49(75.4)
Dyslipidemia	
No	26(40)
Yes	39(60)
Chronic complications	
No	31(47.7)
Yes	34(52.3)

vidual's self-esteem; 70.8% of the individuals in the studied sample obtained high scores. The scores obtained in each scale were compared with the variables of interest.

Table 3 presents the significant values found among the variables of interest.

Table 3 - Relationship between the study's variables and the locus of control - São Paulo - 2005

Characteristics	Locus of Control (p)			Self-esteem (p)
	Internality	Powerful others externality	Chance-externality	
Gender	0.11	0.37	0.01	0.052
Marital status	0.64	0.92	0.36	0.23
Schooling	0.14	0.66	0.12	0.34
Per capita income	0.14	0.79	0.09	0.35
BMI	0.87	0.38	0.33	0.32
Medication therapy	0.67	0.78	0.07	0.50
Smoking	0.52	0.78	0.19	0.06
Alcohol	0.50	0.33	0.28	0.20
Exercise	0.02	0.01	0.004	0.18
Hypertension	0.99	0.25	0.35	0.44
Dyslipidemia	0.78	0.66	0.80	0.71
Chronic complications	0.26	0.55	0.44	0.95

No differences were found among the groups ($p=0.11$) in the comparison between *internal* and gender, according to the Mann-Whitney test. The same results were found with the dimension *external-powerful others* ($p=0.37$). A statistically significant relation was found in the comparison between *external-chance* and gender, that is, women scored higher in this dimension than men. It shows that women had the perception that events they experienced depended on chance.

No statistical differences were found in the comparison between marital status and the locus of control and self-esteem scales. The comparison between self-esteem and schooling did not present statistical significance, though increased self-esteem was proportional with an increased level of schooling.

No significant associations were found in relation to the DM patients' type of treatment and their perception concerning the control of disease. Patients who used a combination of oral and injected medication scored high in the *internal* and *chance* dimensions, though this result was not significant. Self-esteem compared with treatment did not present a statistical significance.

Even though no statistical significance was found, smokers obtained lower scores in the dimension 'external-chance' and non-smokers scored higher in the internal dimension. Smoking DM2 patients obtained higher scores in self-esteem than non-smokers ($p=0.06$).

Those who consumed alcohol obtained higher scores in the *internal* and *external-powerful others* dimensions, even though no statistical significance was found. Similar to smokers, individuals who drank alcohol presented slightly higher self-esteem than those who did not drink alcohol.

Significant results were obtained in relation to exercise. Individuals who exercised obtained higher scores in both the dimensions *internal* and *powerful others* ($p=0.02$ and $p=0.01$ respectively) while those who did not exercise obtained higher scores in the dimension *external-chance* ($p=0.004$). The self-esteem of individuals who exercised and who did not exercise did not differ. Individuals who exercised scored slightly higher in self-esteem but no statistical significance was found.

In relation to the presence of hypertension among DM2 patients, both hypertensive and normotensive individuals obtained high scores in the *internal* dimension though the results were not statistically significant. No statistically significant relationship was found between hypertension and self-esteem in this sample.

Dyslipidemia was not related to locus of control for health nor was self-esteem. Patients with chronic complications scored lower in the dimension *external-chance*. Chronic complications were not associated with patient self-esteem.

Table 4 - Comparison between scores obtained in the scales and time of diagnosis - São Paulo - 2005

Time of diagnosis	Internal dimension	Powerful others-external	Chance-external	Self-esteem
Coefficient "r"	0.33463	0.138	0.181	-0.185
p-value	0.00662	0.273	0.149	0.139
Cases	65	65	65	65

A good correlation was found in relation to the time of diagnosis reported by patients and the internal dimension of locus of control, that is, the longer the time of diagno-

sis, the greater the perception of these individuals of having internal control.

Table 5 - Comparison between the scores of scales and HBAc1 - São Paulo - 2005

Glycated hemoglobin	Internal dimension	Powerful others-external dimension	Chance-external dimension	Self-esteem
Coefficient "r"	-0.104	-0.2668	0.0555	-0.0446
p-value	0.411	0.0318	0.6595	0.7232
Cases	65	65	65	65

Comparison between the last result of glycated hemoglobin and the dimensions of locus of control revealed there is a negative relation between 'external-powerful others' and the value of HBAc1. That is, the worse the glycemic control obtained by patients, the less patients attribute the control of their health to others or deities.

DISCUSSION

Most of the 65 outpatients with DM2 who composed this study's sample were women (63.1%): 41 patients were an average age of 61 years old. It is known that the prevalence of chronic diseases such as DM is high among elderly individuals⁽¹⁵⁾.

Self-esteem scores obtained by the study's sample are similar to another study that found high scores for self-esteem as a result of a program encouraging DM2 patients to exercise⁽¹⁶⁾.

Women scored higher in *external-chance*, that is, they attributed control of their disease to chance, which may negatively affect DM control.

No relation was found between socio-demographic or clinical characteristics and locus of control either in women or men, which is a different result from another study that demonstrated that women scored higher in the internal dimension when gender was related to the disease, due to women's multiple social roles and depression⁽¹⁷⁾. Internally-oriented women have a greater predisposition to happiness and increased self-esteem even if they play several social roles such as mother and worker⁽¹⁷⁾.

Most of the interviewees were married (61%), had a professional activity (66.1%), and had not completed primary school (55.4%). Most of the interviewees' had low levels of education. No significant association was found between schooling and locus of control.

Individuals who exercise scored higher in *internality* and those who did not exercise scored higher in the dimension *external-powerful others*. Comparison between the last result of glycated hemoglobin and the dimensions of locus of control revealed a negative relationship between *external-powerful others* and the HbAc1 value. Hence, the higher the HbAc1 result (indicating worse gly-

cemic control), the less the patients attribute the control of their health to other individuals or deities.

Time since diagnosis in patients was an average of 15 years; more than 70% of the patients presented glycated hemoglobin of 8% or more. Most of the patients used a combination of oral and injected medication, which indicates this population had inadequate management of their disease; their control values were above what is expected to avoid complications⁽¹⁶⁾.

A good correlation was found in relation to the time of diagnosis reported by patients and the internal dimension of locus of control. As the time since diagnosis increased, so did the patients' perception of internality in the control of their experiences.

Statistically significant correlations were found between *internality* with time since diagnosis and exercise; between *external-powerful others* with glycated hemoglobin and exercise; and between *external-chance* and exercise.

CONCLUSION

Evaluating locus of control and self-esteem may become essential tools to guide health actions directed to DM patients because such information can support a better understanding of the psychosocial factors involved in the difficulties one has in managing this chronic disease.

This study's results revealed that participants scored high on the self-esteem scale despite their health disorders and unfavorable conditions related to clinical and socio-demographic conditions.

Statistically significant relationships were found between the internal dimension with time since diagnosis and exercise; between *external-powerful others* with glycated hemoglobin and exercise; and between *external-chance* and exercise.

The limited sample size may have contributed to the reduced significance obtained in most comparisons. Yet, this study's results agree with those found in the limited literature available that addresses the theme. The replication of this study with a larger number of participants is suggested.

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