



Relationship between knowledge, attitude, education and duration of disease in individuals with diabetes *mellitus**

Relação entre conhecimento, atitude, escolaridade e tempo de doença em indivíduos com diabetes mellitus

Relación entre conocimiento, actitud, escolaridad y tiempo de enfermedad en individuos con diabetes mellitus

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ABSTRACT

Objectives: To relate the knowledge and attitudes of users with type 2 diabetes *mellitus* (DM2), according to educational level and duration of disease. Methods: This was a quantitative, descriptive transversal study conducted in a Basic Health District Unit in the municipality of Ribeirão Preto, SP, in 2010. We interviewed 123 users with DM2, who met the inclusion criteria. For data collection we used: *Knowledge Questionnaire* (DKN-A) and *Questionnaire of Psychological Attitudes about Diabetes* (TA-19). Data were collected through direct interviews. For the analysis, we used the Fisher exact test. **Results:** The mean age was 63.87 ± 9.09 years, 4.54 ± 3.66 years of study, mean disease duration 11.18 ± 8.64 years. The education and disease duration were statistically significant ($p < 0.01$ and 0.02 , respectively) for the acquisition of knowledge and readiness for self-care in diabetes. **Conclusions:** education and disease duration are variables that influence the knowledge and attitude of patients with DM2. **Keywords:** Diabetes mellitus, type 2; Knowledge; Attitude; Educational status

RESUMO

Objetivos: Relacionar o conhecimento e a atitude de usuários com Diabetes *mellitus* tipo 2 (DM2), conforme a escolaridade e o tempo da doença. **Métodos:** Estudo de abordagem quantitativa, descritivo transversal realizado em uma Unidade Básica Distrital de Saúde do município de Ribeirão Preto, SP, em 2010. Foram entrevistados 123 usuários com DM2, que atenderam aos critérios de inclusão. Para coleta de dados, foram utilizados: Questionário de Conhecimento (DKN-A) e Questionário de Atitudes Psicológicas do Diabetes (ATT-19). Os dados foram obtidos por meio de entrevista dirigida. Para a análise, utilizou-se o teste Exato de Fisher. **Resultados:** a média de idade foi de $63,87 \pm 9,09$ anos, $4,54 \pm 3,66$ anos de estudo, tempo médio de doença $11,18 \pm 8,64$ anos. A escolaridade e o tempo de doença mostraram-se estatisticamente significantes ($p < 0,01$ e $0,02$, respectivamente) para a aquisição do conhecimento e prontidão para o autocuidado em Diabetes. **Conclusões:** escolaridade e tempo de doença são variáveis que influenciam o conhecimento e atitude do paciente com DM2.

Descritores: Diabetes mellitus tipo 2; Conhecimento; Atitude; Escolaridade

RESUMEN

Objetivos: Relacionar el conocimiento y la actitud de usuarios con Diabetes *mellitus* tipo 2 (DM2), conforme la escolaridad y el tiempo de la enfermedad. **Métodos:** Estudio de abordaje cuantitativo, descriptivo transversal realizado en una Unidad Básica Distrital de Salud del municipio de Ribeirão Preto, SP, en el 2010. Fueron entrevistados 123 usuarios con DM2, que reunían los criterios de inclusión. Para la recolección de los datos, fueron utilizados: Cuestionario de Conocimiento (DKN-A) y Cuestionario de Actitudes Psicológicas de la Diabetes (ATT-19). Los datos fueron obtenidos por medio de entrevista dirigida. Para el análisis, se utilizó el test Exacto de Fisher. **Resultados:** El promedio de edad fue de $63,87 \pm 9,09$ años, $4,54 \pm 3,66$ años de estudio, tiempo promedio de enfermedad $11,18 \pm 8,64$ años. La escolaridad y el tiempo de enfermedad se mostraron estadísticamente significativos ($p < 0,01$ e $0,02$, respectivamente) para la adquisición del conocimiento y prontitud para el autocuidado en Diabetes. **Conclusiones:** La escolaridad y el tiempo de enfermedad son variables que influyen en el conocimiento y actitud del paciente con DM2.

Descriptores: Diabetes mellitus tipo 2; Conocimiento; Actitud; Escolaridad

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INTRODUCTION

Diabetes *mellitus* (DM) interferes in all dimensions of people's lives, from the most trivial routine to the desire to continue living healthily. This chronic condition imposes changes in people's life habits, such as commitment to medication therapy, diet and physical exercise, which demands coping skills to make the necessary adjustments, so as to maintain good metabolic control. The commitment to follow or the desire to interrupt treatment, translated into a positive or negative attitude towards the disease, is always present in the daily lives of DM patients ⁽¹⁾.

Health professionals' understanding that patients' attitudes towards treatment are neither stable nor crystallized imposes the search for comprehensive, effective and problem-solving care ⁽²⁾. The attitude, understood as a predisposition to the adoption of self-care actions, can be taught and learned. Also, it receives influence from cognitive, motivational and emotional components. Its presumed power to influence the subject's response to an object – in this case DM management, has determined different researchers' interest in measurement techniques with a view to assessing attitudinal changes ⁽³⁾.

Attitude is a key construct to understand an individual's trend to adopt and maintain certain behavioral standards. Knowledge is conceptualized as a set of information individuals need to master to administer their health condition. Only knowledge is not enough, however, to promote behavioral change, which also involves other variables, including: education, diagnosis time, health and disease-related beliefs, family support, easy access to health services, among other dimensions. Studies that investigate these variables' relation with DM patients' knowledge and attitudes are still scarce ⁽⁴⁾.

A study at a Brazilian research and community service center, which investigated the knowledge and attitudes of 82 adult DM patients who participated in an educative program for Diabetes self-care, showed that 78.05% scored more than 8 on Diabetes knowledge, indicating adequate knowledge and understanding of the disease. As for attitudes, scores ranged between 25 and 71 points, suggesting difficulties to cope with the illness. The study appointed that, despite participants' high scores on knowledge, they did not change their attitude with a view to more adequate coping with the disease ⁽⁵⁾.

The significant correlation between the attitude and knowledge of DM patients evidences that increased knowledge is associated with a trend to assume self-care ⁽⁶⁾. In DM treatment management in particular, this trend, translated into positive attitudes, enhances

disease-associated stress reduction, greater treatment receptiveness, trust in the multiprofessional team, improved self-esteem, sense of self-efficacy, a more positive perception on health and social acceptance ⁽⁷⁾.

Although knowledge is a pre-requisite for self-care, it cannot be the sole and main factor involved in the educative process. Knowledge combined with decision making shared with patients, according to their values, in addition to perceived self-care barriers, motivation and proposed targets, can lead to the adoption of positive attitudes towards treatment ⁽⁸⁾.

Thus, it is perceived that low knowledge levels and negative attitudes towards the disease are factors that still interfere in metabolic control and treatment adherence. Studies showing the relation between demographic and clinical variables for knowledge acquisition and readiness for self-care remain scarce in the literature ⁽⁴⁾. We hope that this study can offer support for Nursing actions, particularly the importance of considering demographic and clinical variables for knowledge acquisition and self-care readiness in planning Diabetes education programs.

In view of the above, this study aimed to relate the knowledge and attitudes of DM users, according to education and time since diagnosis.

METHODS

This quantitative, descriptive and cross-sectional study was developed at a District Primary Health Unit of an interior city in São Paulo State, Brazil, between August and October 2010. For the purpose of the study, users diagnosed with type 2 Diabetes mellitus (DM2) were included, confirmed in the health file, adults and elderly patients, male and female, in conditions to answer the questions asked and who accepted to participate in the research.

The convenience sample consisted of 123 adult DM2 patients under follow-up at the unit during the study period. For data collection, a systemized script was used, considering demographic (gender, age, marital status, education and occupation) and clinical variables, the Diabetes Knowledge Questionnaire (DKN-A) and the Diabetes Attitude Questionnaire (ATT-19). These questionnaires were translated to Portuguese and validated in Brazil ⁽⁹⁾. The instruments were submitted to test-retest reliability analysis, resulting in Kappa coefficients between 0.56 and 0.69 for the DKN-A and between 0.45 and 0.60 for the ATT-19, indicating moderate reliability levels for both.

The DKN-A is a self-applied questionnaire, containing 15 multiple-choice items on different aspects related to general Diabetes knowledge. It consists of five broad categories: basic physiology – includ-

ing insulin action, hypoglycemia, food groups and their substitution, DM management in case of some other illness and general principles of disease care. The measurement scale ranges from 0 to 15 and each item is scored one for correct answers and zero for incorrect answers. Items one to 12 demand a single correct answer. For items 13 to 15, only some answers are correct, all of which should be given to receive score one. Scores higher than eight indicate knowledge on diabetes.

The ATT-19 is a self-applied questionnaire that measures psychological adjustment to DM, developed in response to the need to assess psychological and emotional aspects of the disease. It consists of 19 items that include six factors: DM associated stress, treatment receptiveness, trust in treatment, personal effectiveness, perceived health and social acceptance. Scores are reversed for questions 11, 15 and 18. The main application of the attitude scale is associated with the assessment of educative interventions. Each answer is measured on a five-point Likert scale (I totally disagree – score 1 until I totally agree – score 5). The total score ranges from 19 to 95 points. Scores higher than 70 indicate a positive attitude towards the disease.

To collect data on demographic and clinical variables, knowledge and attitudes, structured interviews

were used, which were applied individually in face-to-face situations, in a reserved environment, and took an average 30 minutes. First, the study aims were clarified and, after participants had signed the Informed Consent Term, the interview started. Answers to the questions were registered on the form itself, at the same time as the interview.

The variables education and time since diagnosis were grouped for analysis. The following were considered for education: illiterate, unfinished primary education, finished primary education, unfinished secondary education, finished secondary education/unfinished higher education and finished higher education. As for diagnosis time, the following intervals were considered: up to 5 years, between 6 and 15 years, between 16 and 25 years and ≥ 26 years.

A database was constructed and the double-entry technique was used for validation. Diverging data were corrected. For analysis, data were transferred to SAS 9.0 software. Frequencies were calculated and Fisher's Exact test was applied, which measures the association between two qualitative variables. Approval for the project was obtained from the Research Ethics Committee at the University of São Paulo at Ribeirão Preto College of Nursing, Brazil, Protocol number 1.092/2009.

Table 1 – Relation between knowledge and education of type 2 diabetes mellitus users attended at a District Primary Health Care Unit, n(%)=123, Ribeirão Preto, SP

	Education						Total
	Illiterate	Unfinished primary education	Finished primary education	Unfinished secondary education	Finished secondary education / Unfinished higher	Finished higher education	
≤ 8	15 (12.20)	55 (44.72)	5 (4.07)	2 (1.63)	3 (2.44)	2 (1.63)	82 (66.67)
> 8	1 (0.81)	29 (23.58)	2 (1.63)	–	9 (7.32)	–	41 (33.33)
Total	16 (13.01)	84 (68.29)	7 (5.69)	2 (1.63)	12 (9.76)	2 (1.63)	123 (100.00)

Fisher's Exact Test: p-value: <0.01

Table 2. Relation between knowledge and time since diagnosis of type 2 diabetes mellitus users attended at a District Primary Health Care Unit, n(%)=123, Ribeirão Preto, SP

Knowledge	Diagnosis time (years)				Total
	Up to 5	6 to 15	16 to 25	≥ 26	
≤ 8	27 (22.31)	35 (28.93)	11 (9.09)	7 (5.79)	80 (66.12)
> 8	16 (13.22)	12 (9.92)	13 (10.74)	–	41 (33.88)
Total	43 (35.54)	47 (38.84)	24 (19.83)	7 (5.79)	121 (100.00)

Fisher's Exact Test: p-value: 0.02

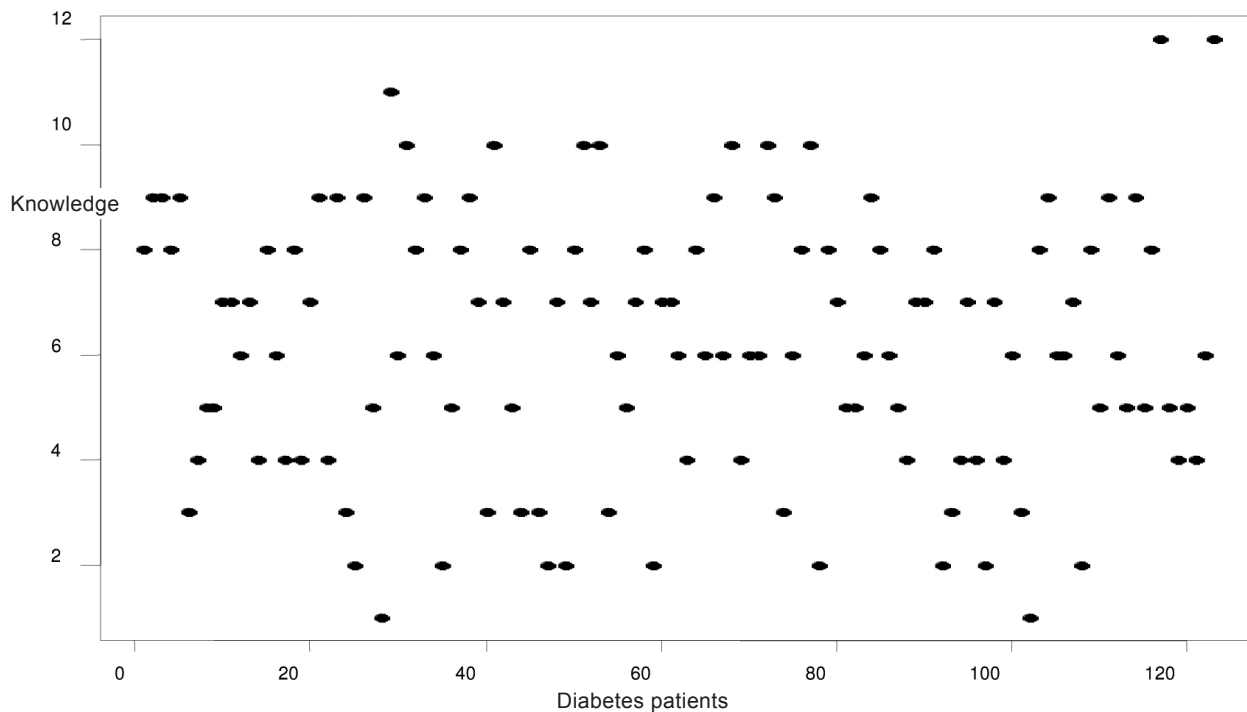


Figure 1. DKN-A scores on disease knowledge among DM2 patients attended at a District Primary Health Care Unit, n=123, Ribeirão Preto, SP.

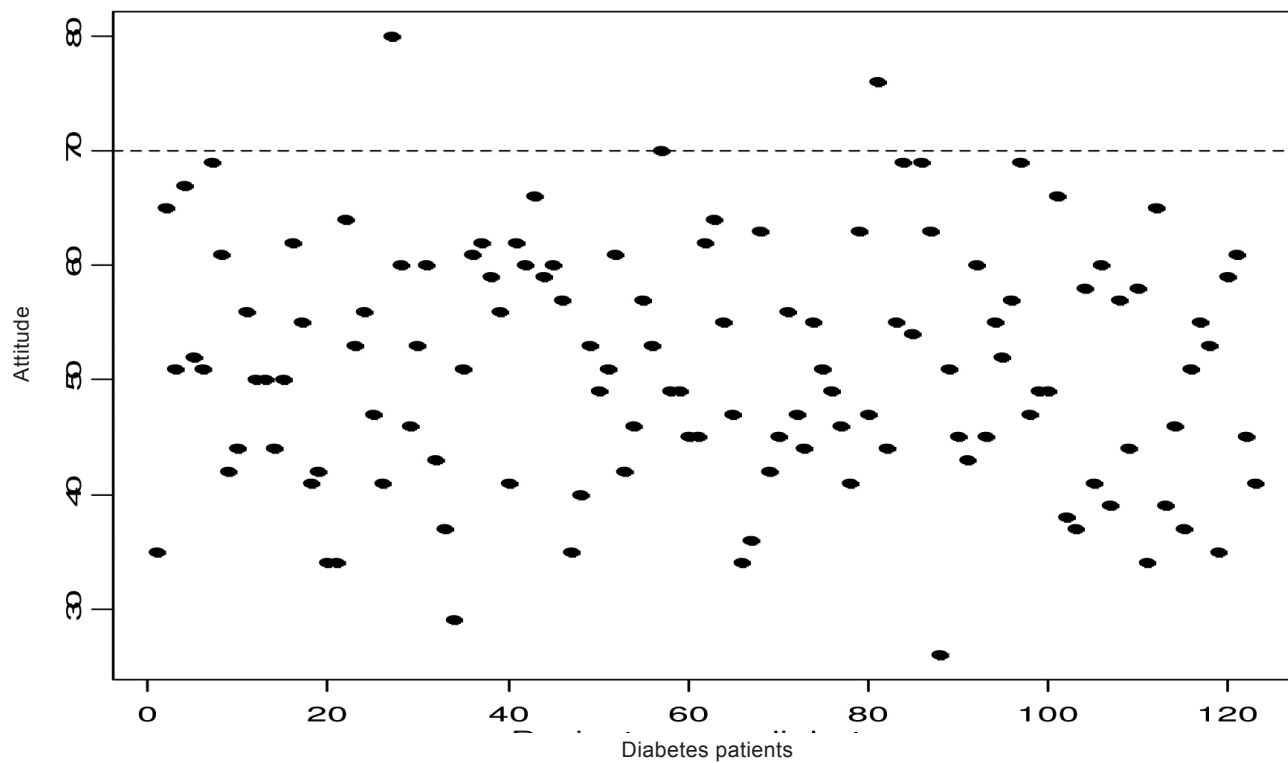


Figure 2. ATT-19 scores on disease coping attitudes among DM2 patients attended at a District Primary Health Care Unit, n=123, Ribeirão Preto, SP.

RESULTS

The results showed that, among the 123 (100%) users with DM2, the female gender predominated (69.11%) and ages ranged between 28 and 83 years, with a mean 63.87 ± 9.09 years. As for education, the users showed 4.54 ± 3.66 years of study. Most participants were married (58.24%), literate (87%) and retired (52.03%). The mean time since diagnosis was 11.18 ± 8.64 years.

As for the knowledge and attitude scores, most users scored less than eight for knowledge on the disease, indicating unsatisfactory results for the understanding and adoption of self-care practices, and also scores of 70 or less, indicating low readiness for disease management. Fisher's Exact test of knowledge scores according to education and time since diagnosis, evidenced $p < 0.01$ and 0.02 , respectively, demonstrating statistical significance.

Figure 1 displays the range of DM2 users' knowledge scores in response to the DKN-A questionnaire.

Concerning knowledge scores, 82 (66.67%) users with type 2 Diabetes mellitus showed scores of eight or less, indicating dissatisfactory knowledge on the disease.

Figure 2 shows the range of DM2 users' attitude scores in response to the ATT-19 questionnaire. The minimum score is 19 and the maximum 95. Scores higher than 70 indicate a positive attitude towards the disease.

With regard to attitude scores, 120 (97.56%) DM2 users showed scores of 70 or less, suggesting difficulties to cope with the disease.

On Fisher's Exact test for DKN-A knowledge scores according to education and time since diagnosis variables, $p < 0.01$ and 0.02 , respectively, showing statistical significance (Tables 1 and 2).

No statistical significance was found on Fisher's Exact test for ATT-19 attitude scores according to education and time since diagnosis.

DISCUSSION

Users with DM2 showed low education levels, with a mean 4.54 years of study, in line with other studies⁽¹⁰⁾. A research in Mexico, involving 141 DM2 patients, which assessed knowledge on the disease, showed that most (74%) of the subjects had not finished primary education⁽¹¹⁾.

The present study findings are also in accordance with a study that investigated the clinical, psychological and social factors interfering in the knowledge of DM2 patients. That study showed that subjects' knowledge was unsatisfactory and that age, gender, years of education, cognitive function, treatment time and depression level interfere in knowledge about the disease⁽¹²⁾.

On the other hand, another study evidenced that the development of DM2 does not depend on education and can affect people of all socioeconomic levels⁽¹³⁾. Low education levels can enhance non-adherence to the therapeutic plan though, due to difficulties to read and understand the prescription, thus increasing health risks. Besides, low education levels can limit information access, probably due to compromised reading, writing and speaking skills, as well as the understanding of the disease and treatment's complex mechanisms^(14,15).

The complexity of the disease and treatment confront diabetes educators with challenges to strengthen the cognitive, motor and affective skills of affected patients with a view to maintaining metabolic control. In that sense, education is a fundamental variable in the choice of innovative and effective strategies to empower patients of advanced age with low education levels.

Low education is acknowledged as a predominant characteristic in the population public health services attend. In this study, as the population is adult, one cannot expect any changes in this variable. Hence, the situation poses challenges to the multiprofessional health team concerning the strategies to be used to enhance treatment adherence. On the other hand, it should be taken into account that the education level by itself does not represent the main challenge. Studies show the need to examine patients' beliefs regarding self-care⁽¹⁶⁾, diet therapy⁽¹⁷⁾, diabetic foot⁽¹⁸⁾ and knowledge on the disease⁽¹⁹⁾.

The present study findings showed that health professionals need to go beyond the vertical care model, looking further than treatment-related aspects. They should also consider other implications involved in care delivery to DM patients, such as cultural aspects, particularly the beliefs that support patients' attitudes and maintain their behaviors. As attitudes constitute readiness for action, understanding beliefs can contribute to modify unhealthy life habits. This is an important requisite to redirect diabetes care programs. Health professionals need to understand that patients' difficulties to engage in behavioral change can only be overcome through the transformation of attitudes and beliefs about the disease and treatment. The nursing care that is currently offered at health institutions, however, has not managed to incorporate this evidence into clinical practice yet.

As for the time since diagnosis, users with DM2 showed a mean 11.18 years of evolution. Time since diagnosis is a relevant variable, as it is inversely related with treatment adherence. The longer the diagnosis time, the lesser the prevalence of users' treatment adherence will be and the greater the risk of complications resulting from unsatisfactory metabolic control⁽²⁰⁾.

The present study findings support the results of a prospective study in Mexico, which assessed the impact of educative strategies on diabetes self-care during one year in 70 DM2 patients. The mean time since diagnosis of those study subjects was 12 years⁽²¹⁾.

In the Brazilian context, a study at *Hospital do Servidor Público Estadual de São Paulo-SP*, which investigated the epidemiological profile and the knowledge level about the disease and diabetic retinopathy in a sample of 357 DM patients, also showed that the mean diagnosis time of DM was 12.6±9.1 years⁽²²⁾.

Studies appoint that, in the establishment of DM2 diagnoses, people already present some kind of complication⁽²³⁻²⁵⁾. Difficulties to exactly determine the duration of DM2 should be highlighted, due to the asymptomatic period preceding the diagnosis. Difficulties to specify the evolution time of the disease were also found in a prevalence study in Ribeirão Preto-SP, which showed that 25% of subjects with DM did not know their diagnosis⁽²⁵⁾. Another prevalence study, developed seven years later in the same city, detected that 15% of subjects did not know the diagnosis⁽²⁴⁾.

The chronic nature of DM, the severity of its complications and the means needed for its control have raised the costs for people, families, communities and society. The disease's progression can make individuals abandon their work or experience professional performance limitations⁽²¹⁾.

These results indicate that education and diagnosis time need to be considered when structuring Diabetes education programs that attend to users' actual and potential needs. In that sense, knowing the extrinsic and intrinsic factors interfering in disease control and directing people's adherence to the therapeutic plan is fundamental with a view to Nursing care excellence in care delivery to DM2 patients.

CONCLUSIONS

These study results appoint that education and diagnosis time are variables related with the knowledge and attitudes of DM patients. Most DM2 users scored less than eight on knowledge about the disease, indicating unsatisfactory results for understanding and adoption of self-care practices. As for attitude scores, almost all participants showed scores of 70 or less, indicating low readiness for disease management.

Evidence that education and diagnosis time variables are clinically relevant for Nursing care suggest that, to plan an educative program, diversified educational strategies need to be adopted, including the well-dosed use of motivational resources, as chronic patients need to live with their disease for the rest of their lives and, throughout this process, they experience ups and downs with regard to their condition.

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