

## KNOWLEDGE ON DIABETES MELLITUS IN THE SELF CARE PROCESS<sup>1</sup>

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*This descriptive study in the interior of São Paulo aimed to verify diabetes mellitus patients' knowledge about the disease, causes and complications, highlighting its importance in self care. Data were collected through interviews with 84 persons and analyzed through descriptive statistics. Average age was 53.3±13 years, time of disease 12.9±9 years and 58% of the participants did not finish basic education. Only 28.6% of the participants gave correct answers to "what is diabetes" and "what are its causes"; 71% were diagnosed without presenting classic symptoms and 64% had already been hospitalized due to an acute or chronic complication. We indicated aspects that turn the learning process more difficult; little knowledge about the disease, its causes and symptoms, thus affecting the prevention and early diagnosis and entailing predisposition towards complications. Furthermore, the interference of biopsychosocial factors in the self care process is highlighted.*

**DESCRIPTORS:** nursing; diabetes mellitus; knowledge and self care

## EL CONOCIMIENTO SOBRE DIABETES MELLITUS EN EL PROCESO DE AUTOCUIDADO

*Estudio descriptivo realizado en el interior de São Paulo, cuyo objetivo fue verificar el conocimiento de las personas con diabetes mellitus en relación con la enfermedad, causas y complicaciones subsecuentes, destacando su importancia en el autocuidado. Los datos fueron recolectados en 84 personas por medio de entrevista y analizados mediante estadística descriptiva. La edad media fue de 53,3±13 años, tiempo de la enfermedad de 12,9±9 años y 58% de los participantes tenían primaria incompleta. Apenas 28,6% respondieron correctamente sobre "qué es diabetes" y "cuáles sus causas"; 71% fueron diagnosticados sin la presencia de los síntomas clásicos y, 64% ya habían sido internados por alguna complicación aguda o crónica. Se indicó aspectos que dificultan el proceso de aprendizaje, poco conocimiento en relación con la enfermedad, etiología y síntomas, comprometiendo la prevención y el diagnóstico precoz, predisponiéndolos a las complicaciones. Se resaltan la interferencia de los factores biopsicosociales en el proceso de autocuidado.*

**DESCRIPTORES:** enfermería; diabetes mellitus; conocimiento y autocuidado

## O CONHECIMENTO SOBRE DIABETES MELLITUS NO PROCESSO DE AUTOCUIDADO

*Estudo descritivo realizado no interior paulista, cujo objetivo foi verificar o conhecimento das pessoas com diabetes mellitus em relação à doença, causas e complicações advindas, destacando sua importância no autocuidado. Os dados foram coletados de 84 pessoas por meio de entrevista e analisadas mediante estatística descritiva. A média de idade foi 53,3±13 anos, tempo de doença 12,9±9 anos e 58% dos participantes tinham ensino fundamental incompleto. Verificou-se que apenas 28,6% incluíram-se na categoria correta sobre "o que é diabetes" e "quais suas causas"; 71% foram diagnosticados sem apresentar sintomas clássicos e 64% foram internados por alguma complicação aguda ou crônica. Indicou-se, aqui, aspectos que dificultam o processo de aprendizagem, pouco conhecimento em relação à doença, etiologia e sintomas, comprometendo a prevenção e diagnóstico precoce, além da predisposição para as complicações. Ressalta-se a interferência dos fatores biopsicosociais no processo de autocuidado.*

**DESCRIPTORES:** enfermagem; diabetes mellitus; conhecimento e autocuidado

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## INTRODUCTION

Chronic health conditions are responsible for 60% of the global disease burden. In developing countries, treatment adherence reaches a mere 20%, generating negative health statistics and entailing high costs for families, society and governments<sup>(1)</sup>.

In this group of health conditions, diabetes mellitus stands out because of high morbidity and mortality rates, as well as increasing prevalence levels. Diabetes mellitus requires clinical care and permanent education to prevent acute and chronic complications<sup>(2)</sup>.

Ambiguities and uncertainties provoked by diabetes mellitus lie at the basis of patients' demands/needs, which can be immediate or long term. The demands/needs deriving from diabetes have been categorized as psychosocial, self-care and related to knowledge and skills<sup>(3)</sup>.

Thus, integral care for diabetes patients should cover psychosocial and cultural aspects. Therapeutic education is fundamental to inform, motivate and strengthen patients and families to live with the chronic condition. Each care session needs to reinforce health risk perception, skills development and motivation to overcome this risk<sup>(4)</sup>.

According to literature, health care that provides adequate information, support and monitoring can improve adherence, which will reduce the burden of chronic conditions and provide a better quality of life to diabetes patients<sup>(1)</sup>. In this sense, it is important to be able to detect and act on the patient's signs of readiness for behavior and lifestyle changes<sup>(3)</sup>.

With a view to supporting care for diabetes mellitus patients and identifying probable factors that intervene in this process, this study aimed to verify these patients' knowledge about the disease, causes and complications, highlighting its importance in self-care.

## METHODOLOGY

We carried out a descriptive and cross-sectional study at the Endocrinology and Metabolism Outpatient Clinic of the Clinical Hospital at the University of São Paulo at Ribeirão Preto College of Nursing (HCFMRP-USP), Brazil, between April 2000 and April 2001. During this period, 659 male and female patients with diabetes mellitus were attended, who were older than 20. Eighty-four of these patients volunteered for the study.

Participants were selected through the outpatient care files and were invited to participate

when they came to the clinic. Volunteers received and signed the free and informed consent term.

Data were collected through an interview, held in a private room. The researcher and/or her assistant applied a semi-structured instrument before or after the medical appointment. Interviews took an average of 45 minutes.

The instrument was previously submitted to face and content validation by professionals active in this area and tested during the pilot study. Modifications were made on the basis of the suggestions and difficulties/limitations that had been identified. The first part of the instrument included demographic data, about smoking and sedentariness; the second part covered data related to knowledge about the disease, such as: what is diabetes and what are its causes, laboratory tests for diagnosis and control and, in addition, acute and chronic complications.

Answers related to knowledge and causes of diabetes were classified in the following categories: *correct*, *partially correct*, *wrong* and *does not know*. For the *correct* category, a minimum of two correct answers was considered, against one for the *partially correct* category; the *wrong* category referred to incorrect answers and those not related to the question; *does not know* was used when the patient expressed this phrase.

Data were analyzed through categorization and transcription into a structured database, using Excel. Then, data were processed in EPIINFO, by means of descriptive statistics.

This study was approved by the Research Ethics Committee at the HCFMRP-USP.

## RESULTS

The study population's average age was 53.3±13.4 years, 58.5% possessed less than eight years of education and 38.1% were widowed/single. Average disease time as indicated by patients was 12.5±8.5 years (Table 1).

Table 1 - Sociodemographic and clinical characteristics (n=84). Ribeirão Preto-SP, 2001

Characteristics	Values
Age in years ( $\bar{X}$ /± standard deviation)	53,3±13,4
Gender – male / female (%)	44/56
Unfinished basic education (n/%)	49/58,3
Widowed or single (n/%)	32/38,1
Retired or housewife (n/%)	62/73,8
Diabetes* type ½ (%)	14,3/85,7
Disease time in years ( $\bar{X}$ /± standard deviation)	12,5±8,5
Insulin treatment (n/%)	60/71,4

\*79 persons

Table 2 shows answer categories about *what is diabetes?* and *what are its causes?*

Answers were crossed to highlight participants' knowledge.

Table 2 - Knowledge about diabetes and its causes (n=84). Ribeirão Preto, 2001

What is diabetes?	Causes of Diabetes				Total
	Correct Hereditary, lifestyle, stress	Partially correct Hereditary or lifestyle	Wrong Not related to the disease	Does not know Does not know	
Correct Pancreas problems, does not produce insulin, does not burn sugar	24	-	-	-	24
Partially correct High blood sugar level	15	15	-	6	36
Wrong Not related to the disease	-	-	-	6	6
Does not know Does not know	-	-	-	18	18
<b>Total</b>	<b>39</b>	<b>15</b>	<b>-</b>	<b>30</b>	<b>84</b>

When participants were asked about normal blood glucose levels, only 24 (8.6%) gave a correct answer, i.e. between 70 and 110 mg/dl, while 21 (25%) mentioned only one of these levels. Twenty-two participants' answers (26.2%) were considered incorrect because they did not fit into this range and 17 (20.2%) patients could not answer.

In view of the importance of recognizing signs and symptoms of the disease and early diagnosis, which can motivate people to seek professional health care, participants were asked about the main complaints that led to the diabetes diagnosis (Table 3).

Table 3 - Symptoms that led to diabetes diagnosis (n=83). Ribeirão Preto, 2001

Complaints mentioned by participants	Multiple answers		
	Frequency	%	Accumulated
Sight problems	11	13,3	11
Polydipsia	21	25,3	32
Polyuria	14	16,9	46
Fatigue	6	7,2	52
Dry mouth	4	4,8	56
Other health problems	59	71,1	115
Other reasons*	5	6,0	120

\*Annual routine consultation

We also verified whether participants knew that badly controlled diabetes can cause other health problems. Eighty-one (96.4%) gave a positive answer and indicated acute and chronic complications. Table 4 displays the 276 answers we obtained.

Table 4 - Health problems related to or caused by diabetes (n=81). Ribeirão Preto, 2001

What problems can diabetes cause to your health?	Multiple answers		
	Frequency	%	Accumulated
Hyperglycemia	47	56,0	47
Hypoglycemia	38	45,2	85
Coma	11	13,1	96
Ketoacidosis	5	6,0	101
Kidney problems	26	31,1	127
Eye problems	40	47,6	167
Sexual impotence/gastrointestinal problems	26	31,0	193
Vascular problems	29	34,5	222
Foot problems	39	46,4	261
Other	15	17,9	276

## DISCUSSION

We found a relatively young adult population, including more women (56%), retired or housewives (73.8%), with unfinished basic education (58.3%); average disease time of more than ten years, and 85.7% were type 2 diabetes mellitus patients.

A recent study<sup>(5)</sup> of type 2 diabetes mellitus patients of long duration, aimed at describing the clinical, psychological and social factors interfering in knowledge, identified unsatisfactory knowledge about the disease, strongly influenced by age, years of education, treatment time, cognitive function, gender and depression level.

Another study of diabetes patients<sup>(6)</sup>, aimed at assessing knowledge and disease management, as well as the relation between this knowledge and diabetes control, showed that adequate knowledge level was not related to glucose control. The same study reported that knowledge is only one of the

variables able to influence metabolic control, and that lifestyle and beliefs can also exert strong impact on people's behavior.

Low education levels can certainly limited information access, due to possible reading, writing, comprehension or even speech problems<sup>(7)</sup>. This condition can reduce access to health-care related learning opportunities, especially when acknowledging that, in general, adult patients are responsible for their own daily care.

Persons with this education level also seem to attach less value to disease prevention actions and tend to seek medical care with some delay, which entails a great impact on and high demands for financial resources directed at health care<sup>(7)</sup>. In addition, this delay can stimulate the worsening of the disease.

In this sense, diabetes patient education stands out as a fundamental care aspect to control the disease and, thus, prevent or delay the appearance of acute and chronic complications, helping patients to promote quality of life.

The disease's early development and natural history should be sufficiently well understood to identify disease progression measurement parameters. Even if studies demonstrate a strong relation between the incidence of diabetes, fasting hyperglycemia and glucose intolerance, other factors, independently associated with the development of the disease, such as age, family history, waist-hip ratio, body mass index, arterial pressure and lipid levels, should also be taken into account<sup>(2)</sup>.

The general population needs to understand these risk factors, whether separately or jointly, with a view to the inclusion of primary prevention actions in daily behavior. Data in Table 2 reveal the fragility of this aspect, as only 24 (28.6%) patients gave correct answers *about diabetes* and *its causes*.

We could also observe lack of knowledge about the same questions in the study population's relatives<sup>(8)</sup>, which represents yet another complicating factor for diabetes management, as relatives are considered to be the closest support for chronic disease patients.

Another relevant aspect is patients' knowledge of desirable standards of normality for glucose, identified in 24 (28.6%) participants. Knowledge about these levels can stimulate patients' involvement in self-care, if they are aware that their glucose level can vary within a certain range, and thus help in daily glucose monitoring.

On the one hand, we identified a lack of knowledge, associated with disease time, age and education. On the other, there is the complex process of obtaining information and knowledge about the pathogeny of diabetes, as well as their incorporation in care. This characterizes a problem in the study population, which deserves emphasis and strengthens the need for innovative strategies to promote this population's adherence to treatment and obtain greater participation in education programs.

During the long course of the disease, diabetes patients may have received some kind of information about its pathogeny. However, factors intervening in the process of obtaining this information may have limited/imposed its incorporation. In this sense, socioeconomic and cultural factors facilitate/difficult knowledge, besides personal aspects (social/family support, psychological aspects and disease perception) and health service access.

One way of addressing relevant aspects of diabetes care is the constitution of systemized orientation groups or education programs. However, it is important for these programs to take into account the characteristics of the target population, which will make them look for strategies that are useful to each group, considering age, cognitive level, skills, limitations, availability and interests.

In our study, 20 (23.8%) participants informed they had participated or were participating in an orientation group (data not included). A study at the same outpatient unit, aimed at analyzing difficulties these patients mentioned to participate in education groups, also found low participation levels. Related causes were: lack of interest, inadequate time and transport difficulties, while more than 40% were not aware that this group existed<sup>(9)</sup>.

The above factors should be considered when transmitting information to patient, with a view to favoring knowledge incorporation and adequate treatment follow-up, which should be proposed in partnership between the patient and the health professional, in accordance with individual needs. Education group programs should be disseminated appropriately and continuously, making available meeting times, to obtain better reception in the target population.

When asked about what laboratory tests were used to diagnose diabetes, 41 (48.8%) participants mentioned the blood test and 28 (33.3%) blood and urine. With respect to exams to control diabetes over

time, 72 (85.7%) patients indicated blood and urine tests and (8.3%) only blood tests (data not included). Other tests, such as cholesterol dosage (HDL, LDL), triglycerides and creatinin, are important parameters to assess metabolic control but receive little emphasis in care for diabetes patients.

Another aspect that does not receive much attention is blood pressure control, considering arterial hypertension as a common comorbidity of diabetes<sup>(2)</sup>. A randomized prospective clinical study<sup>(10)</sup> of about 7000 recently diagnosed type 2 diabetes patients showed a significant relation between the incidence of macro and microvascular complications and increased systolic blood pressure. Each 10 mmHg decrease in average systolic blood pressure corresponded to a 12% decrease in risk for any diabetes-related complication.

Data related to chronic micro and macrovascular complications of the population in this study were discussed in a previous article<sup>(11)</sup>.

Classical symptoms that made people seek health care included polydipsia and polyuria, to a reduced extent (Table 3). However, in most patients, diabetes was diagnosed as a consequence of other health problems.

Between nine and 12 year passes between the start of hyperglycemia and the type 2 diabetes mellitus diagnosis, due to the fact that glucose concentration is not sufficiently high for the appearance of classical symptoms<sup>(12)</sup>. This increases the risk of micro and macrovascular complications<sup>(2,13-14)</sup>.

As to the presence of acute and chronic complications of diabetes, Table 4 shows hyperglycemia, eye problems, foot problems and hypoglycemia. These suggest that the study population has received information about the severity of the disease.

Data not included here demonstrated that 54 (64.3%) participants had already been hospitalized for one of these complications, with an average hospitalization time of 3.1 days. Considering multiple answers, the most frequent problems were hyperglycemia (63.0%), coma (14.8%), hypoglycemia (13.0%) and foot problems (11.1%). These data can be related to the duration and bad control of diabetes, indicating a population at risk for complications.

Approximately 33% of diabetes patients are hospitalized during the first years of the disease due to acute complications, which can be prevented

through adequate glucose control. Hyperglycemia, hypoglycemia and diabetic ketoacidosis represent 24% of problems at emergency services<sup>(14)</sup>.

In summary, these data reveal the fragility of preventive actions, due to scarce basic knowledge about the disease, causes, signs/symptoms, management and prevention of acute and chronic complications.

The contents examined here are usually included in diabetes education programs. However, participation levels are low, possibly due to access difficulties, availability and personal motivation.

Some reasons for low participation in these groups can be attributed to the fact that these patients only seek medical care in acute situations. On the other hand, the number of health professionals available for exclusive dedication to education and prevention activities is still insufficient. Another factor is professional training, which prioritizes curative actions to the detriment of prevention.

Professionals active in education/prevention should be familiar with education strategies that allow them to adapt to the needs and limitations of participating adults, understanding that, in general, this group possesses low education levels and may not be interested in this type of care. Information contents need to be transmitted in a simple way, however, guaranteeing impact in the target population, motivating people to learn about the disease and actively assume their role in treatment and care, integrating their personal structure, beliefs and psychosocial state.

Some strategies for this type of population include theories related to the health belief model, self-efficacy, control locus, cognitive dissonance, diffusion, learning stages and finally, adult theory<sup>(7)</sup>.

Each of these theories requires broad knowledge and practice, in line with the health professional's and the target population's understanding. These strategies for interrelation between participants and professionals can be of help in participants' learning. This can lead to better treatment follow-up, highlighting patients as protagonists in care for their disease.

Information provided in learning should be significant to the person. If not, it will not be integrated into that person's stock of knowledge and skills. Therefore, getting to know participants' previous interests and knowledge is an important phase in the education process<sup>(6)</sup>. In this context, activities need

to be programmed according to the identified needs and each situation context, including risk levels for complications.

Knowledge about diabetes and its importance in the self-care process allows us to value the need to create awareness in the population about risk factors for the development of diabetes, as well as chronic complications among patients. These aspects should be included in education programs and diabetes mellitus tracking campaigns, with a view to arousing motivation and interest.

## CONCLUSIONS

This study indicated aspects that difficult the learning process, such as age (mean  $53.3 \pm 13$  years), disease time (mean  $12.9 \pm 9$  years) and low education level (58% had unfinished basic education). These conditions can limit the incorporation of information in this population and, consequently, jeopardize prevention and early diagnosis, besides predisposing to complications.

We also revealed other aspects interfering in the learning process, such as biopsychosocial factors and health service access.

With respect to knowledge about "what is diabetes?" and "what are its causes?", we found that only 24 (28.6%) participants gave correct answers, while 24 (28.6%) patients gave wrong answers or did not know the answer.

Considering multiple answers, 71% of the study population was diagnosed without presenting classical diabetes symptoms, and 64% had already been hospitalized due to acute or chronic complications, such as hyperglycemia (63.0%), coma (14.8%), hypoglycemia (13.0%) and foot problems (11.0%).

These results shows the fragility of knowledge about diabetes, causes and complications for disease management, which can be related to factors intrinsic to patients and to the health system, complicating access to basic information. This reveals the need for health professionals to redirect strategies for care to diabetes patients, in view of biopsychosocial factors and existing resources at the health unit.

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