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Original Articles

Knowledge about diabetes in patients hospitalized for heart disease: a descriptive research

Daila Alena Raenck da Silva[1], Raquel Lutkmeier[1], Maria Antonieta de Moraes[1], Emiliane Nogueira de Souza[1]

[1]University Foundation of Cardiology

ABSTRACT

Aim: To assess the knowledge of patients hospitalized for cardiovascular co-morbidities in diabetes mellitus (DM), and its relationship to the confrontation and attitudes towards the disease.

Method: This was a prospective cross-sectional study, conducted in the inpatient unit with cardiac patients affected by DM. Their level of knowledge about diabetes was assessed using the Diabetes Knowledge Scale (DKN-A) and the psychological and emotional aspects were assessed by use of the Diabetes Attitudes Questionnaire (ATT-19).

Results: We included 220 patients with 63.0 ± 9.4 years, of which 119 (54.1%) were male. The punctuation of the scores ≥ eight in DKN-A was found in 55 patients (25%), and a score ≥ 60 on ATT-19 occurred in 37 patients (17.7%).

Discussion: The patients who presented with relatively good knowledge about DM had a score of ≥ eight; those individuals who had a score ≥ 60 on the scale ATT-19 had an appropriate response to the disease.

Conclusion: The patients generally had a low level of knowledge of DM and had difficulty in coping with the disease.

Descriptors: Diabetes Mellitus; Knowledge; Cardiology; Nursing

INTRODUCTION

Diabetes mellitus (DM) is one of the five chronic diseases of major relevance in the health sector, either due to its increasing expansion or the worsening of its complications[1]. According to the American Diabetes Association[2], 23.6 million people now have diabetes mellitus and 380 million will have the disease by 2025. The impact on cardiovascular disease (CVD), related to DM, has been increasing steadily in recent years, occurring two to four times more in these individuals, compared to those without DM. Likewise, the risk of mortality from CVD is two to four times higher in these patients[3].

This was a cross-sectional study, conducted with participants of a program for education regarding self-care in diabetes, which demonstrated that even though 78% of the participants had knowledge and understanding of their clinical condition, they still, however, had difficulty in coping with the disease[4]. In the American scenario, researchers investigated the acceptance of the disease in diabetic patients and the results showed that individuals with better educational standards were more able to accept the disease and, therefore, presented better a metabolic control[5].

Although technological advancements have been emerging in the field of DM, none of them have replaced knowledge and education, which when done well, produce the best results. Both strategies occur in different practicing scenarios and are used by the health professionals as tools to alter the current progression of diabetes and its complications.

Faced with the evidence related to the restricted knowledge about the disease in patients with diabetes and the risk of cardiovascular events, we aimed at verifying the knowledge about DM in a population of patients hospitalized for cardiovascular comorbidities and related it to the coping strategies and attitude necessary regarding the disease.

METHOD

Study outline

This was a cross-sectional study, carried out from January 2009 to June 2010, in a reference center for cardiology the Southern region of Brazil in clinical and surgical inpatient units.

Population and eligibility criteria

Cardiac patients suffering from DM, of both genders, aged 18 years or more were included. Patients presenting chronic degenerative neurological diseases and diagnosed with DM for less than six months were excluded.

Sample calculation

The sample calculation was obtained in a probabilistic manner, based on samples found in studies available in the scientific literature. For a confidence level of 95%, with a margin of absolute error of 6%, and the proportion of little knowledge about diabetes of 60%, 220 patients were needed.

Criteria for diagnosis of diabetes mellitus

The diagnosis of DM can be done through the examination of blood glucose, regardless of age. Those who are considered to be diabetic patients are the ones who manifest symptoms associated with aleatory glycemia equal to, or higher than, 200mg/dL. Just as fasting glucose is equal to or greater than 126mg/dL, in which case fasting is superior to eight hours and lower than 16 hours. It was also observed that it is possible to consider as values within normality one of equal to, or greater than, 140mg/dL after 2 hours of glucose overload[2].

Study Logistics

Data collection began with the active search of medical records of patients with confirmed medical diagnosis of DM. Patients were approached in the first 48 hours of hospitalization. After acceptance to participate in the study, they signed consent forms and answered the research instrument questions. A questionnaire was designed for the collection of clinical and socio-demographic variables. Two other instruments validated in Brazil were used to assess the patients' knowledge and attitudes: the Diabetes Knowledge Scale (DKN-A) and the Diabetes Attitudes Questionnaire (ATT-19)[6].

Instruments

Questionnaire to assess knowledge

The DKN-A, which is attached, was a questionnaire used to assess the knowledge of patients with DM. It contained 15 multiple-choice questions related to general knowledge about the disease, covering aspects such as: recognition of signs and symptoms, the importance (or not) of diet in glycemic control, glucose levels and possible complications of the disease. For each question a score was given: zero (0) for an incorrect question and one (1) for a correct question. At the end of the questionnaire, the score was added up and the higher the score was, the greater was the patient's knowledge about the disease is. According to the scoring parameters and classification developed in the DKN-A, a good knowledge about the disease was observed when the summation of questions reached a level equal to, or greater than, eight[6].

Questionnaire to assess the psychological and emotional aspects of the disease

The ATT-19, which is attached, was a questionnaire that assessed coping with the psychological and emotional aspects of the disease and factors that assisted in the assessment of self-care of these patients regarding DM. It contained 19 multiple-choice questions related to six factors linked to diabetes: disease stress, responsiveness to treatment, trust in the treatment, personal effectiveness, perception about health and social

acceptance. Of these questions, the numbers 11, 15 and 18 began with a reverse score. Each answer had a value ranging from one (strongly disagree) to five (strongly agree). The score varied from 19 to 95 points, and a score equal to or above 60 points indicated a positive attitude, and the inverse denoted a negative attitude regarding the disease.

Ethical Considerations

The development of the study followed the principles of Resolution 196/96 of the National Health Council, which sets standards for research with human beings, in which the anonymity and privacy of respondents must be safeguarded. The study was approved by the Research Ethics Committee of the Institute of Cardiology, under number 4224/08. All participants read and signed the consent form for the study.

Statistical Analysis

The statistical analysis was performed using SPSS 18.0. A descriptive analysis was conducted, in which the variables with normal distribution were classified as categorical, and were expressed as average and standard deviations. However, the variables which were identified as continuous were presented as frequencies. For comparative analysis, we applied the chi-square test, with the aim of determining the level of knowledge and attitudes towards the disease.

RESULTS

In this study, 220 cardiac patients were included, with an average of 63.0±9.4 years of age, white 179 (81.4%), males 119 (54.1%), and average schooling was 5.8±3.8 years of study. Of these, 173 (78.6%) were married and 190 (86.4%) were retired. It was observed that 193 (87.7%) patients had had previous hospitalizations. The DM duration was 8 (3.0 to 11.0) years. The majority of patients (181) had received previous drug treatment (82.3%), among whom 164 (74.5%) had received oral hypoglycemics and 46 (20.9%) had received NPH

insulin. The most prevalent comorbidities were systemic arterial hypertension (188, 85.5%) and unstable angina (111, 50.5%), as shown in Table 1.

Table 1 - Sociodemographic and clinical characteristics of the population (n=220). Porto Alegre- RS, 2010

Variables	n (%)
Socio-demographic Description	
Age (years)*	63 ± 9,4
Male	119 (54,1)
Caucasians	179 (81,4)
Marital Status (married)	173 (78,6)
Ocupation (retired)	190 (86,4)
Years of study*	5,8 ± 3,8
Previous hospitalizations	193 (87,7)
Comorbidities	
Systemic Arterial Hypertension	188 (85,5)
Unstable Angina	111 (50,5)
Acute Myocardial Infarction	104 (47,3)
Dyslipidemia	92 (41,8)
Obesity	76 (34,5)
Cardiac Failure	61 (67,7)
Tobacco Smoking	28 (12,7)
Cerebral Vascular Accident	27 (12,3)
Peripheral Vascular Disease	14 (6,4)
Chronic Renal Failure	13 (5,9)
Disease History	
Treatment for Diabetes	188 (85,5)
Time of Diabetes (years)	8 (3 - 11)
Use of medications	
Anti-diabetic Medications	181 (82,3)
Oral Anti-diabetic	164 (74,5)
Insulin	46 (20,9)
Cardiovascular Medications	211 (95,9)

Source: Elaboration of the authors, 2013

Categorical variables expressed as absolute (n) and relative (%) frequency; *continuous variables expressed as average and standard deviation.

Figure 1 shows the dispersion of scores from the questionnaire DKN-A, with a score equal to, or greater than, eight in 55 patients (25%), indicating that most had little knowledge and understanding of the disease. The relationship between the variables "years of schooling" and "knowledge", 55 (7.5%) patients, had 11 years of schooling and had scores equal to, or greater than, eight correct answers. Between genders, the rates of correct answers were similar, with 32 (26.9%) among men and 23 (22.8%) among women. The question related to high blood glucose had a higher percentage of correct (?) scores with 162 (73.6%), and the

lowest score was given to the knowledge about ketonuria, with 35 (16%) of correct answers. The most important issues related to self-care of DM, as the normal value of capillary glucose, the stable handling of insulin and NPH, and the care for hypoglycemia, had scores of 168 (76.4%), 65 (29.5%), 34 (15.5%) 146 (66.4%), respectively.

Figure 1 – Scores obtained by the participants suffering from diabetes mellitus from the questionnaire DKN-A. Porto Alegre-RS, 2010
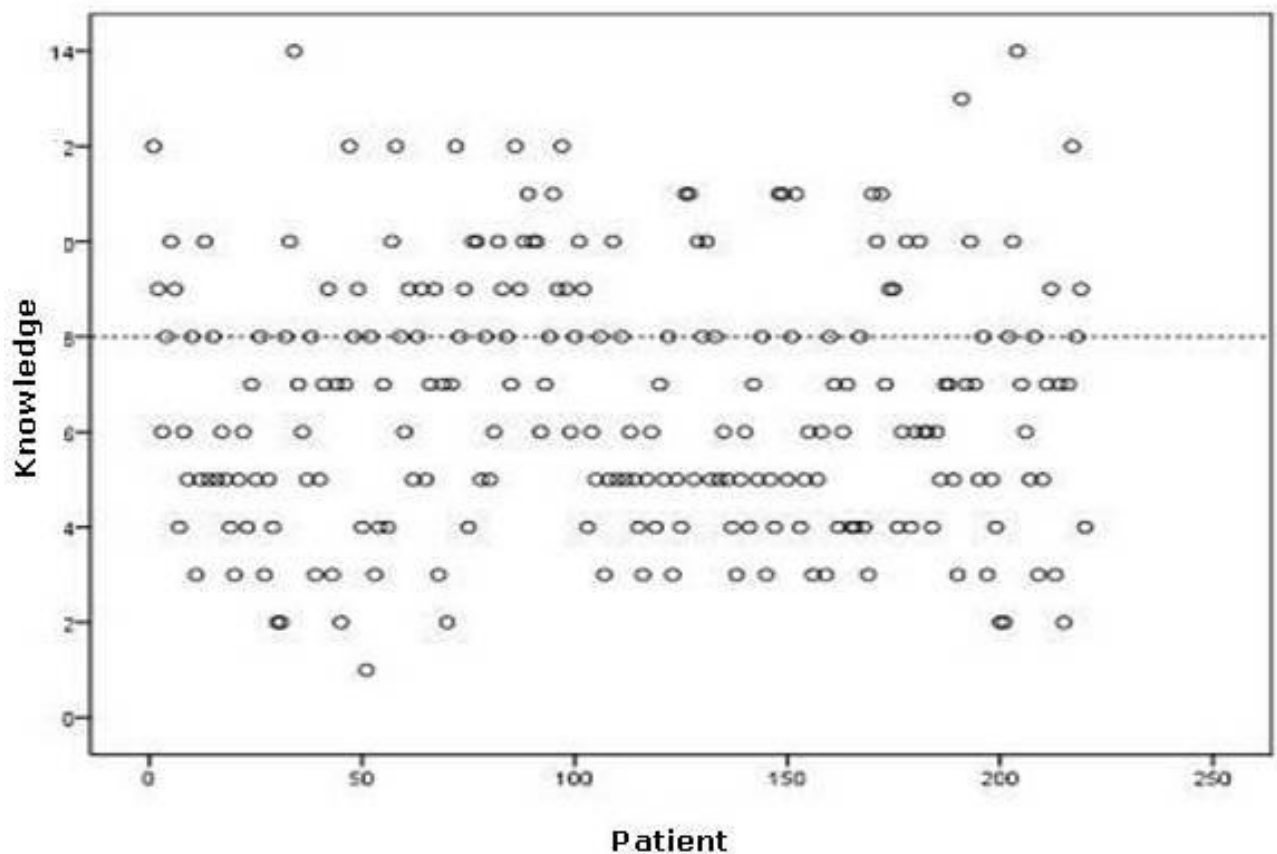
Source: Elaboration of the authors, 2013

In the dispersion of scores in relation to the psychological and emotional methods of coping with the disease, scores were equal to, or greater than, 60 in 37 patients (17.7%), indicating a negative attitude about the disease in most patients. See Figure 2.

Figure 2 - Scores obtained by the participants suffering from diabetes mellitus from the questionnaire ATT-19. Porto Alegre-RS, 2010
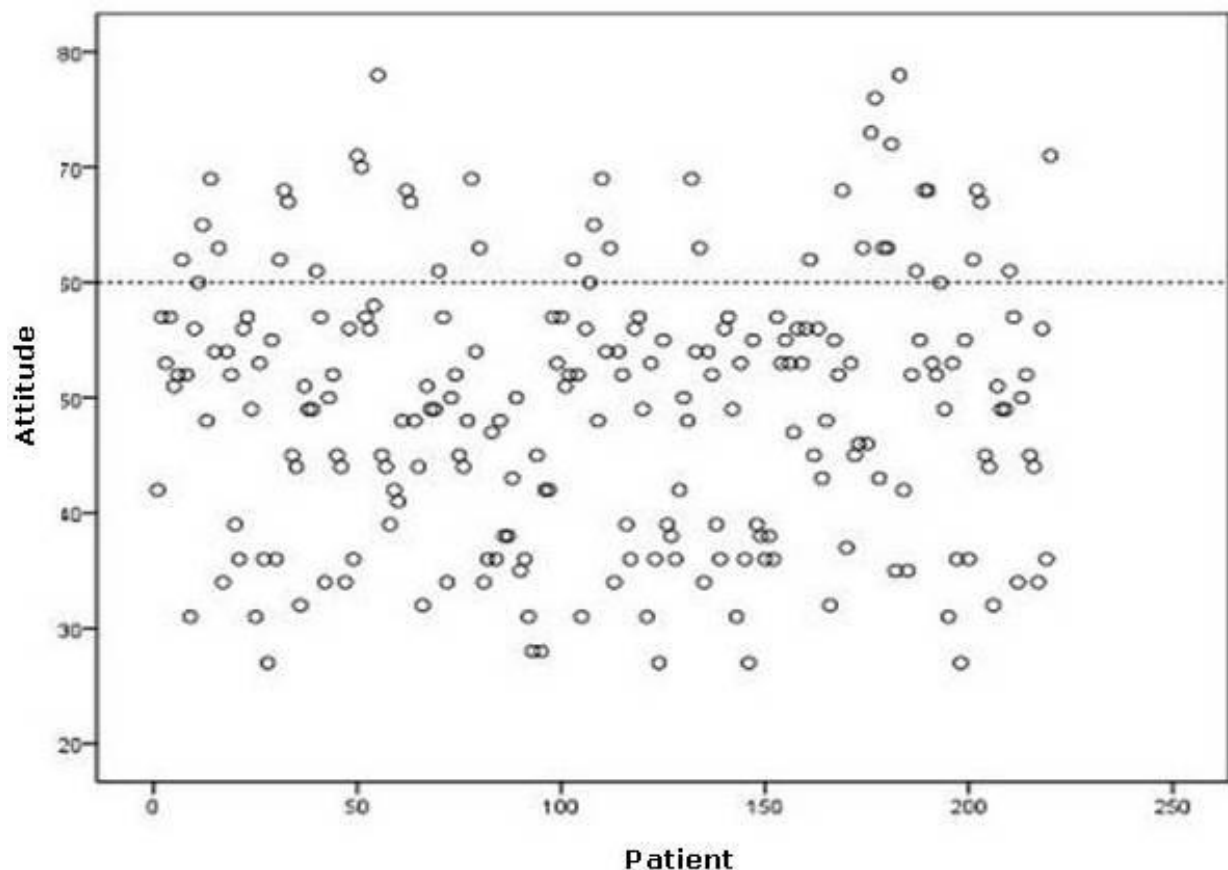
Source: Elaboration of the authors, 2013

The scores obtained among men, 18 (15%), and women, 21 (20%) showed no difference. In comparing the results from the questionnaires, DKN-A - (knowledge) and ATT-19 – (attitudes), it was observed that four (7.5%) of the patients who had adequate knowledge regarding DM also presented a positive attitude.

DISCUSSION

In the present study, it was observed that the majority of diabetic patients hospitalized for cardiovascular comorbidities had a low knowledge of and a negative attitude towards DM, reflected by the scores of the questionnaires. These findings indicate the importance of

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studies on the "real world" condition, providing subsidies so the professionals can intensify health education to this high-risk population. The strategies used by nurses in their hospital practice are still focused on prevention, treatment and cure of diseases, rather than a comprehensive care focused on promoting health[7].

However, unlike our findings, previous studies that assessed the knowledge of DM in a similar population, after instituting educational strategies, observed improvements in knowledge and enhancement of skills in the management of the disease[8,9] .We attribute the difference between the results of this study with other research to the implementation of educational programs developed by the multidisciplinary teams in clinical practice. Thus, in addition to providing the patient with all the information about care for the management of DM during hospitalization, it is necessary to accompany it with information ? for a certain period of time, which will contribute to the decision-making regarding the numerous situations that are imposed by the disease.

When confronted with the psychological and emotional aspects of the disease, it was found that the population did not reach a positive attitude concerning the expected modifications in lifestyle to achieve good metabolic control. Studies that evaluated similar outcomes showed that patients who had previous experience with educational programs and higher education had a better self-care capacity and a higher score for confronting the DM. However, this reinforces the need for training and behavior modification of health professionals to act preventively, thus reducing the damage from the natural evolution of the disease[10,11].

Another study that aimed to determine the ability of self-care for people with type 2 DM, showed a prevalence of regular self-care capacity, linked to a set of values and beliefs that may trigger negative behaviors. From this perspective, health professionals should seek strategies for diverse and innovative teaching, capable of mobilizing patients for self-care[11].

In this study, patients showed good ability for self-care in the most important issues associated with DM, as for the normal values of capillary glucose, insulin management and hypoglycemia care. It is critical that individuals with a significantly complex and chronic disease, such as DM, have an active participation in the monitoring of their disease, for

example, in their care of the selection of the quality and quantity of their food, regular physical activity, self-monitoring of capillary glucose, the examination of their feet, the use of drugs in the right doses and schedules, and in the recognition of the signs and symptoms of decompensation[12].

Comparing the questionnaires DKN-A (knowledge) and ATT-19 (attitudes), it was observed that a minority of patients, 4 (7.5%), had an adequate knowledge of and a positive attitude towards DM. These results suggest that knowledge does not always lead to a change in attitudes and they also suggest that individuals with DM, when presenting any disability and/or limitation, need professional assistance to stimulate their motivation. A collaborative approach between patient and health-care professionals can fill in the gaps of their knowledge and the coping strategies of diabetic patients. The challenge for health educators regarding the peculiarities of the process of teaching and learning for adults remains focused on ensuring effective interventions that promote the incorporation of self-care for disease management.

CONCLUSION

The data showed that the majority of cardiac patients presented a low level of knowledge about and a negative attitude towards diabetes mellitus. These results reinforce the need for the improvement of programs and educational strategies so that diabetic patients can improve their clinical condition and the perception of the benefits and barriers for preventive behaviors. It is important to create strategies that provide the individual with a place for learning and self-care. These measures can be applied in hospitals during hospitalization, or in outpatient clinics and health facilities. It is also verified that multi-professional intervention can have an impact, assisting in understanding and, consequently, influencing for a positive reaction towards the disease. It should be noted that, as a limitation in this study, there is a connection between the two types of diabetes; therefore, we suggest the separation of diabetes mellitus types 1 and 2 for future investigation, as the times of sickness and treatment may interfere with the reactions of understanding and coping with the disease.

Another limiting factor was the need for a prior assessment of the patient's psychological issues, because the presence of momentary imbalances in the individual's mental health may suggest altered results.

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APPENDIX

**Brazilian version of the Questionnaire
Diabetes Knowledge Questionnaire (DKN-A)**

INSTRUCTIONS: this is a brief questionnaire to find out how much you know about diabetes. If you know the right answer, circle the letter in front of it. If you do not know the answer, make a circle around the letter which symbolizes "I do not know."

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1. In uncontrolled diabetes, **blood sugar** is:

    A. Normal
    B. High
    C. Low
    D. I do not know.

2. Which of these statements is **TRUE**?

    A. It does not matter if your diabetes is not under control, since you do not fall into a coma.
    B. It is better to present a little sugar in the urine to prevent hypoglycemia.
    C. A poor control of diabetes can result in a greater chance for complications later on.
    D. I do not know.

3. The **NORMAL** variation rate in blood glucose goes from:

    A. 70-110 mg/dl
    B. 70-140 mg/dl
    C. 50-200 mg/dl
    D. I do not know.

4. **Butter** is mainly composed of:

    A. Proteins
    B. Carbohydrates
    C. Fat
    D. I do not know.

9. If a person with **DIABETES** is taking insulin or becomes ill and cannot eat the

5. **Rice** is mainly composed of:
    A. Proteins
    B. Carbohydrates
    C. Fat
    D. Minerals and vitamins
    E. I do not know.

6. The presence of **ketones in the urine** is:

    A. A good sign
    B. A bad sign
    C. Normally found in those who have diabetes
    D. I do not know.

7. What are the possible complications that are **NOT** usually associated with diabetes below?
    A. Visual alterations
    B. Renal alterations
    C. Lungs alterations
    D. I do not know.

8. If a person who is taking insulin has a **HIGH SUGAR RATE IN THE BLOOD OR URINE**, as well as the presence of centonas, he/she must:

    A. Increase insulin
    B. Decrease insulin
    C. Maintain the same amount of insulin and the same diet and do a blood and urine test later
    D. I do not know.

    FOR THE NEXT QUESTIONS THERE WILL BE **2** CORRECT ANSWERS. MARK THEM.

13. One **KILOGRAM** is**:**

    A. A unit weight

diet prescribed:

    A. He should stop taking insulin immediately
    B. He should continue taking insulin
    C. He should use oral hypoglycemic agents for diabetes instead of insulin
    D. I do not know.

10. If you feel that **HYPOGLYCEMIA** is starting, you should:

    A. Take insulin or an oral hypoglycemic agent immediately
    B. Lie down and rest immediately
    C. Eat and drink something sweet immediately
    D. I do not know.

11. You can eat as much as you want of the following **FOODS:**

    A. Apple
    B. Lettuce and watercress
    C. Meat
    D. Honey
    E. I do not know.

12. **HYPOGLYCEMIA** is caused by:

    A. Excess insulin
    B. little insulin
    C. little exercise
    D. I do not know.

    B. Equal to 1000 grams
    C. A unit of energy
    D. A little more than two grams
    E. I do not know.

14. Two of these substitutions are **CORRECT:**

    A. French bread is **EQUAL** to four (4) crackers
    B. An egg is **EQUAL** to a portion of ground beef
    C. A glass of milk is **EQUAL** to a glass of orange juice
    D. Noodle soup is **EQUAL** to a vegetable soup
    E. I do not know.

15. If I'm not in the mood to eat **FRENCH BREAD** allowed in my breakfast diet, I can:

    A. Eat four crackers
    B. Exchange for 2 average cheese bread loaves
    C. Eat a slice of cheese
    D. Let it be (?)
    E. I do not know.

Brazilian version of the Questionnaire
Diabetes Attitude Questionnaire (ATT-19)

INSTRUCTIONS: This form contains 19 questions to see how you feel about diabetes and its effect on your life. Put an X in the option that matches your answer.

1. If I had no **DIABETES**, I would be a very different person.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

2. I don't like to be called **DIABETIC.**
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

3. Having **DIABETES** was the worst thing that happened in my life.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

4. Most people have difficulty adapting to the fact that they have **DIABETES**.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

5. I often feel ashamed for having **DIABETES**.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree 10. Being diagnosed with **DIABETES** is the same as being sentenced to a life of disease.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

6. It seems that there is not much I can do to control my **DIABETES**.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

7. There is little hope in leading a normal life with **DIABETES**.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

8. The proper control of **DIABETES** involves a lot of sacrifice and inconvenience.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree **9.** I try not to let people know that I have **DIABETES.**
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

16. There is nothing you can do, if you have **DIABETES.**
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree
( ) Totally agree.

17. There is no one I can talk openly to about my **DIABETES**.
( ) I don't agree at all
( ) Disagree
( ) I Don't know
( ) Agree

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11. My **DIABETES** diet does not interfere much with my social life.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.

12. In general, doctors need to be more attentive when treating people with **DIABETES**.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.

13. Having **DIABETES** for a long time changes the personality of the person
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.

14. I have difficulty knowing if I'm well or ill.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.

15. **DIABETES** is not really a problem because it can be controlled.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree

   ( ) Totally agree.

18. I believe that I live well with **DIABETES**.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.

19. I often think it is unfair that I have **DIABETES** and other people have good health.
   ( ) I don't agree at all
   ( ) Disagree
   ( ) I Don't know
   ( ) Agree
   ( ) Totally agree.