ORIGINAL ARTICLE

Determination of attitude and knowledge of type 2 diabetic patients towards insulin therapy in Northern Cyprus

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Abstract

Objective: To determine the attitude and knowledge of type-2 diabetics related to insulin therapy.

Methods: The descriptive cross-sectional study was conducted from January to March 2014 at the Dr. Burhan Nalbantoglu Public Hospital, Nicosia in the Turkish Republic of Northern Cyprus, and comprised patients with type-2 diabetes. The Likert scale was used to score participants' response to questions using the following scoring system: 0 (disagree), 1 (neutral) and 2 (agree). The minimum scoring value for all the questions combined was 0 whereas the maximum scoring value was 50. Patients' attitudes were classified as either high, medium or low based on scores between 0-16, 17-33 and 34-50, respectively. SPSS 16 was used for data analysis.

Results: Of the 271 participants, 165(60.9%) were female and 106(39.1%) male. The overall mean age was 60.3±32.4 years. Moreover, 136(50.3%) participants had a medium attitude and knowledge score towards insulin therapy. men scored significantly better than females ($p<0.05$). Only 25(9.2%) participants had a high score towards insulin therapy.

Conclusion: The participants were found to have an inadequate attitude and knowledge response to insulin therapy.

Keywords: Diabetes mellitus, Insulin therapy, Attitudes and knowledge, Type-2 diabetic patient. (JPMA 67: 343; 2017)

Introduction

Diabetes mellitus (DM) is a chronic metabolic disease. The number of people diagnosed with type-2 diabetes mellitus (T2DM) is gradually increasing the world over, and 80% of these individuals are living in underdeveloped or developing countries.[1-3] According to the International Diabetes Federation (IDF), 381.8 million people worldwide were estimated to have diabetes in 2013. It is expected that this number will rise to 592 million by 2035 unless the appropriate precautions are taken.[2] The prevalence of diabetes in developing countries ranges from 10-15%. In the United States (US), it has been estimated that a total of 25.8 million people (8.3% of the population) have diabetes.[3]

Based on a 2010 study "Turkey Diabetes, Obesity and Hypertension Epidemiology" (TURDEP) II, the prevalence of T2DM was found to be 13.7% and the onset of diabetes was found to be between the ages 40-44.[4] It has become apparent that diabetes is a disease that is gradually increasing at a rate higher than expected in Turkey. In a diabetes screening study performed by the health department of the Turkish Republic of Northern Cyprus (TRNC) in 2008, a total of 18,500 people (age range of 20-80 years) were found to have type I and type 2 diabetes (11%), whereas 30,000 people (18%) were identified to have pre-diabetes.[5]

Among patients with type-I diabetes, insulin therapy is the most appropriate choice for glycaemic control. On the other hand, insulin therapy is recommended for individuals with type-2 diabetes in addition to medical nutrition therapy, weight control, exercise and oral anti-diabetic drugs due to partial insulin reserve.[1-3]

Some studies indicated that the severity of the disease was derived from the failure of non-insulin treatments and patients' perceptions about insulin therapy as being distressful and poorly managed, a poor relationship between patient and healthcare personal was also noted.[6,7] In other studies, misinformation regarding insulin therapy, the lack of knowledge about diabetes, using traditional herbal treatments, a phobia of injections, and low social-economic conditions has hindered the initiation of insulin therapy.[8,9]

Nurses and healthcare professionals are primarily responsible for the initial achievement of patients' adaptation to insulin therapy. Nurses are often the first healthcare team members to interact with patients and are being called on to apply their specialised knowledge, training and skills to educate and motivate patients with diabetes about insulin use and practical ways to achieve treatment goals.[10] The current study was planned to

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determine the attitude and knowledge of T2DM patients towards insulin therapy.

Patients and Methods

The descriptive cross-sectional study was conducted at the Endocrinology and Diabetes Centre (EDC) of Dr. Burhan Nalbantoglu Public Hospital (DBNPH), Nicosia, TRNC, from January to March 2014, and comprised T2DM patients. The DBNPH is the largest hospital in terms of patient number and inpatient bed availability (495-bed) in the TRNC. The only EDC located in TRNC was founded in DBNPH in 2009, and has so far provided services with two attending physicians and three nurses to a total of 10,424 diabetic patients; this figure also includes regularly visiting patients. In addition to fulfilling out-patient services, diabetes specialist nurses also conduct weekly and monthly training programmes. A total of 16,650 patients with T2DM are registered at the DBNPH, EDC. Patients enrolled in the current study were using oral anti-diabetic drugs and insulin therapy. Patients administered to the EDC within the preceding three months (except repetitive patients), were included in the current study following the consideration of expert opinions from the Department of Biostatistics, Medical Faculty, the Near East University. All the participants were aged above 28 years and were treated with insulin and oral anti-diabetic drugs. The participants were aware of their diagnosis and were all able to verbally express their condition, had no physical or mental handicap and were willingly able to answer questions related to the current study.

The questionnaire designed for the current study contained questions concerning patients' socio-demographic characteristics, diabetes and their attitude towards insulin therapy.

This questionnaire was prepared in an attempt to identify the attitude of T2DM individuals towards insulin therapy in accordance with the current and relevant literature.[6,11-16] The expert opinion was obtained from specialists in diabetes and endocrinology, including both doctors and nurses, while formulating the questionnaire. A total of 25 questions (23 negative and 2 positive) evaluating the attitudes and knowledge of individuals regarding insulin were included in the questionnaire in order to assess the attitude of participants towards insulin therapy. The Likert scale was used to measure participants' attitudes. Responses to questions were scored between 0 and 2 as follows: 0 (disagree), 1 (neutral) and 2 (agree). The minimum combined score for all items was 0, whereas the maximum score was 50. Patients' attitudes were determined as high, medium or low according to scores which lie between 0-16, 17-33 and 34-50, respectively. There was an inverse proportion between scores and patients' attitudes. Factor analysis was used in order to validate the questionnaire which was designed to assess the attitude of participants

Table-1: Kaiser-Meyer-Olkin (KMO) and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.557
Bartlett's Test of Sphericity	Approx. Chi-Square	5837.934
	df	300
	Significance	0

a. Based on correlations

Table-2: Reliability Statistics.

Cronbach's Alpha	No. of Items
0.789	25

Figure: Factor Analysis; scree plot graph of the eigenvalue against the component number.

Table-3: Factor analysis of variance.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.292	25.166	25.166
2	3.892	15.568	40.735
3	2.970	11.882	52.617
4	1.687	6.746	59.363
5	1.305	5.220	64.583
6	1.262	5.050	69.633
7	1.134	4.537	74.170
8	0.947	3.786	77.956
9	0.906	3.626	81.582
10	0.781	3.124	84.706
11	0.661	2.643	87.349
12	0.545	2.180	89.529
13	0.496	1.985	91.514
14	0.382	1.526	93.041
15	0.361	1.442	94.483
16	0.323	1.292	95.775
17	0.316	1.263	97.038
18	0.201	0.802	97.841
19	0.174	0.697	98.537
20	0.100	0.399	98.937
21	0.090	0.360	99.296
22	0.056	0.226	99.522
23	0.050	0.201	99.723
24	0.043	0.171	99.894
25	0.026	0.106	100.000

The first 13 components represent 91. 5% of the total variance.

towards insulin therapy.

The value of the Kaiser-Meyer-Olkin (KMO) test was 55.7%, which was appropriate for the factor analysis of the data set (0.557>0.05) (Table-1). Therefore the sample size was large enough to provide a reliable answer to the research question. Since, the significance of Bartlett's test was <5%, it might be concluded that the correlation between the variables was high. The questionnaire was answered by interviewing each participant individually by reading each question to the participant and then giving each answer a value according to the scoring system. The interviews were conducted at the EDC outpatient services (8:00am-12:00am). Participants who had any concerns regarding their condition and/or treatment were directed to the appropriate physicians and nurses. SPSS 16 was used for data analysis.

Frequency and percentage values were used in order to determine the answers relevant to the socio-demographic characteristics of the participants, and to assess the knowledge and attitudes of participants to the disease. The reliability of the analysis of the collected data was determined using Cronbach's alpha test where the reliability coefficient was found to be significant (Cronbach's alpha: 0.789) (Table-2). Chi-square and Kruskal-Wallis tests and factor analysis (Figure; Table-3) were used for the comparative evaluation of variables.

Approval was obtained from the Inpatient Treatment Corporate Office, Ministry of Health, TRNC, and the Near East University's ethics committee.

Informed consent was obtained from all the participants.

Results

Of the 271 participants, 165(60.9%) were female and 106(39.1%) male. The overall mean age was 60.3±32.4 years.

Besides, 92(33.9%) participants had diabetes for 5 to 10 years, and 132(48.7%) of them had other chronic disease in addition to diabetes. Diabetic retinopathy was found as the most common diabetic eye disease, affecting 68(25.1%) participants. The frequency of high blood glucose, i.e. 269(99.2%), was determined to be higher than low blood glucose, i.e. 88(32.5%). Moreover, 113(41.6%) participants had glycated haemoglobin (HbA1c) values between 6 and 9 and 83(30.7%) had no laboratory results.

Furthermore, 112(41.3%) participants used only insulin, 96(35.4%) only oral anti-diabetic drugs and 63(23.3%) used both types of medication. Also, 159(58.7%) patients indicated that they had used oral anti-diabetic drugs; among these patients, 70(44%) had been using oral anti-diabetic drugs for 1 to 5 years and 98(61.6%) had been using it twice daily. Of all the patients, 175(64.6%) were using insulin; of them, 77(44%) had been on insulin for less than a year and 90(51.4%) were using insulin twice a day. Of all, 151(55.8%) participants stated that they had shown adequate adaptation to the treatment. However, among patients using insulin for less than a year, 21(23.3%) stated that they had shown less adaptation to the treatment.

Of all the participants, 86(31.7%) believed insulin therapy would affect their social life, 102(37.6%) stated that insulin therapy might affect their weight gain, 146(53.9%) said insulin injection would be painful, 143(52.8%) said insulin therapy would suggest previous treatments had failed, while 203(74.9%) believed that insulin therapy caused depression.

Also, 104(38.4%) individuals believed that insulin therapy would make them more dependent on their doctor, while 105(38.7%) were uncertain about the therapy. Moreover, 116(42.8%) stated that insulin injection would not result in loss of time, 141(52%) were afraid of insulin injections,

Table-4: Attitude of diabetic individuals towards insulin therapy and factor analysis.

Attitudes and Factors	Factor Load	Disagree (0)		Neutral (1)		Agree (2)	
		s	%	s	%	s	%
Factor-1 Discontent perception is that insulin use will have negative implications							
Insulin therapy will affect my social life	0.532	120	44.4	64	23.7	86	31.9
Insulin therapy will affect my weight	0.482	84	31.0	85	31.4	102	37.6
Insulin injections will be painful	0.432	123	45.4	2	0.7	146	53.9
Insulin therapy suggests that prior treatments failed	0.526	42	15.5	86	31.7	143	52.8
Insulin therapy is demoralising	0.601	40	14.8	28	10.3	203	74.9
Insulin therapy would make me more reliant on a doctor	0.741	62	22.9	105	38.7	104	38.4
Insulin injections would be time consuming	0.688	116	42.8	77	28.4	78	28.8
I am afraid to take insulin injections	0.567	120	44.3	10	3.7	141	52.0
Insulin injections are a cause of embarrassment	0.042	161	59.4	19	7.0	91	33.6
Factor-2 Social isolation perception is that insulin use will effect social interactions							
Insulin injections would make me feel isolated from society	-0.180	156	57.6	28	10.3	87	32.1
Factor-3 Anxiety perception is that insulin use will harm family and friend relationships							
Insulin therapy concerns me	0.475	35	12.9	18	6.7	218	80.4
Insulin therapy makes my family more concerned about me	0.454	11	4.1	26	9.6	234	86.3
Insulin therapy makes my friends more concerned about me	0.348	22	8.1	66	24.4	183	67.5
Insulin treatment would be an economical burden on me	-0.254	97	35.8	94	34.7	80	29.5
Factor-4 Fear perception is that insulin use will cause self-harm							
I am afraid of self-injecting	0.201	117	43.2	28	10.3	126	46.5
Factor-5 Anger perception is that insulin use will effect mental health							
Insulin therapy may make my diabetic condition worse	0.179	70	25.9	112	41.3	89	32.8
The deterioration of my health makes me angry	-0.294	30	11.1	-	-	241	88.9
I don't want to hear anything about insulin therapy	-0.078	185	68.3	9	3.3	77	28.4
Factor-6 Hopeless/ Restoring hope and acceptance following insulin use							
I have feelings of resentment towards people who do not have diabetes	0.488	149	55.0	8	3.0	114	42.0
Insulin therapy makes me more aware of any related news	-0.144	46	17.0	16	5.9	209	77.1
Insulin therapy normalises blood sugar levels more effectively than oral anti-diabetic drugs	0.44	53	19.6	112	41.3	106	39.1
There is not enough accessible information about insulin therapy. therefore extensive training should be provided	0.215	19	7.0	29	10.7	223	82.3
Factor-7 Inability/ Sensitivity							
Insulin therapy should only be a choice of treatment once other treatments have failed	0.189	54	20.0	105	38.7	112	41.3
Complications of insulin treatment scare me	-0.400	26	9.6	53	19.6	192	70.8
Insulin therapy can prevent diabetes associated complications more effectively than oral anti-diabetic drugs	0.129	35	13.0	147	54.4	88	32.6

Extraction Method: Principal Component Analysis.
Varimax with Kaiser Normalization. 7 component extracted.

while 161(59.4%) acknowledged that insulin injection was not a cause of embarrassment. Besides, 156(57.6%) patients receiving insulin therapy stated that insulin therapy did not create a feeling of isolation from society; however, 218(80.4%) participants had concerns about insulin therapy, whereas 234(86.3%) and 183(67.5%) considered insulin therapy as a health concern amongst family and friends, respectively.

In addition, 80(29.5%) participants were worried about the economic burden of insulin therapy, 126(46.5%) were afraid of self-injection and 112(41.3%) were undecided about starting insulin therapy fearing it might have a negative impact on the progress of the disease. Apart from that, 241(88.9%) participants had a feeling of anger due to the impairment of their health, 77(28.4%) were not interested in hearing about insulin injections while 114(42%) felt a sense of jealousy towards healthy individuals.

Any news regarding insulin therapy was important for 209(77.1%) of the participants, 112(41.3%) of them were undecided about the benefit of insulin therapy, particularly in regulating blood glucose when they were compared with oral anti-diabetic drugs, whereas 223(82.3%) participants thought that their knowledge about insulin therapy was not adequate and that they had to be trained by a healthcare professional. Interestingly, 112(41.3%) participants thought that the meaning of starting insulin therapy was a failure in the management of their previous treatment regimen, 192(70.8%) were afraid of the complications of insulin therapy and 147(54.4%) were undecided about the efficiency of insulin therapy in the prevention of diabetic complications when compared with oral anti-diabetic drugs (Table-4).

Table-5: Average score of attitude of diabetic individuals towards insulin therapy.

Rate Averages n:271	Total scale score S	%
0-16 Higher attitude	25	9.2
17-33 Medium attitude	136	50.3
34-50 Low attitude	110	40.5

Table-6: Average scores of attitudes of diabetic individuals towards insulin therapy according to the type of treatment.

Bottom Sizes	Average score towards insulin therapy X ±SS	Minimum	Maximum	χ^2 p
Only oral anti-diabetic users (n: 96)	36.3±5.03	27	45	88,5
Oral anti-diabetic and insulin users (n: 63)	26.7±8.72	13	43	0,00
Only insulin users (n: 112)	25.8±7.06	12	38	p<0.05
Total	29.7±8.40	12	45	

χ^2: Kruskal-Wallis Test.

As far as the score of attitude is concerned, 136(50.2%) participants achieved medium score (17-33), 110(40.6%) low score (34-50) and 25(9.2%) achieved high score (0-15) (Table-5).

The maximum mean score (36.3±5.03) against insulin therapy was seen in individuals using only oral anti-diabetic drugs, whereas the lowest average score (25.8±7.06) was achieved by individuals receiving only insulin therapy. The difference between the average score was found to be significant (p<0.05) (Table-6).

Discussion

Diabetes is one of the most common chronic diseases worldwide, affecting all age groups. In developing countries, diabetes is common amongst individuals aged between 45 and 64 years, and its frequency is higher in females. The average age of individuals enrolled in the study was 60.29 ± 32.4 years and the number of females (60.9%) was found to higher than males. The findings from the current study are comparable with that of the literature.[15-18]

In the present study, it was found that 62.2% of individuals with chronic disease except diabetes used only insulin therapy and individuals with no chronic disease other than diabetes used only oral anti-diabetic drug treatment. In a study, 89.8% of individuals using oral anti-diabetic drug treatment took their drugs regularly and did not experience any difficulties during the treatment. The compliance with treatment (insulin therapy) in diabetic individuals with additional chronic diseases proved to be more complicated.[17.18]

In the present study, adaptation to treatment was determined as medium by their own expression in 55.8% of diabetic individuals. The study stated that 66.2% of diabetic individuals defined the adaptation to treatment as "fine" with their own expression.[17] In a study, the rate of adaptation to treatment was found to be 71.7% in diabetic patients.[19] The adaptation to the treatment was determined as medium by 45.7% of individuals who were enrolled in the study and using insulin. According to 52.8% participants, failure in compliance with previous treatments and the evaluation of the adaptation to the treatment as medium were in reference to insulin therapy. It was suggested by the participants that their knowledge about insulin therapy was not adequate which might affect their overall attitude to the therapy. In the present study, 75% of the individuals taking oral anti-diabetic drugs defined the adaptation to the treatment as "fine". In a study, 16.2% of diabetic individuals were found to be using their drugs regularly.[20] Regular use of drugs is a significant indicator of adaptation to the treatment.

A study stated that individuals diagnosed with diabetes had to have adequate knowledge and skill and a positive attitude for controlling diabetes successfully in their daily life.[21] One study emphasised that education was effective on patients' attitudes and the mean score of patients receiving appropriate information regarding diabetes was found to be better.[19]

In the current study, 31.9% participants found that insulin therapy limited their social life. This result might be a consequence of inadequate knowledge (not knowing storage conditions of insulin analogues) regarding insulin therapy by diabetic individuals.

Moreover, 74.9% participants thought that insulin therapy was a depressing situation and 80.4% had concerns about insulin therapy. One study found that the fasting blood glucose and diastolic blood pressure decreased as a result of a positive attitude towards diabetes. On the other hand, a negative attitude caused an increase in the fasting blood glucose levels, diastolic blood pressure and high-density lipoprotein (HDL) cholesterol.[22] As a result, developing a positive attitude against the disease was important in obtaining targeted levels of fasting blood glucose and diastolic blood pressure.

The participants said that insulin therapy was more beneficial in regulating blood glucose levels by comparison with oral anti-diabetic drugs; however, insulin injection was considered to be painful and failure in the maintenance of previous treatments was associated with starting insulin therapy in 39.1%, 53.9% and 41.3% of the participants, respectively. These statistics revealed that

diabetic individuals had a negative attitude towards insulin therapy. Besides, 52.8% participants stated that a failure in the maintenance of previous treatments was associated with starting insulin therapy. A comprehensive training programme may help patients to develop a positive attitude towards insulin therapy.

In the present study, 38.4% of the diabetic individuals feared that starting insulin therapy would increase dependence on doctor. According to Nakar et al., 47% of diabetic individuals were not using insulin as they thought that their disease was not serious, so insulin therapy was thought to be unnecessary.[6] However, 7% of patients prior to taking insulin therapy thought that their condition was not serious.

In diabetic individuals, injection phobia is a significant barrier in starting insulin therapy. In the present study, 52% participants stated that they were scared of insulin injections. A study determined that diabetic individuals were unwilling to take insulin therapy.[23] In addition, Anari et al. reported that insulin injection would be painful for all age groups.[24]

Diabetic individuals enrolled in the current study revealed that receiving insulin therapy caused anxiety in family members about his/her health (86.3%), and the impairment of their health was an irritating situation for family members (88.9%). In a study performed on individuals with T2DM taking insulin therapy, the frequency of depression was found to be 21%. It is, therefore, necessary to consider an integrated approach, which suggests that the diagnosis and treatment of psychiatric disorders associated with the disease are necessary in addition to physical treatment.[25]

In the current study, a majority of diabetic individuals (70.8%) stated that they were scared of diabetic complications. Wong et al. determined in their study that diabetic individuals had a negative attitude against insulin therapy due to its complications.[23] Furthermore, 82.3% of diabetic individuals declared that their knowledge about insulin therapy was inadequate and they had to be trained by a healthcare professional (physician, nurse, etc). It is well established that education is an important step in the prevention of diabetic complications.

In the Nakar et al. study, the fear of addiction was found amongst patients who did not take insulin therapy; in contrast, this condition was not frequently detected in individuals taking insulin therapy.[6] In a study performed on individuals taking oral anti-diabetic drug treatment, the number of negative evaluations towards insulin therapy was found to be higher in comparison with individuals taking insulin therapy.[9] The relationship between individuals taking oral anti-diabetic drugs and a negative attitude against insulin therapy was found to be significant, a finding that is comparable with our study. Wong et al. reported that diabetic individuals were scared of any pain associated with injections and incorrect injections. Moreover, they were concerned about the difficulties associated with self-injecting at home and work.[23] In a study conducted in Iran, diabetic individuals stated that insulin injection was painful and difficult, and they were concerned about weight gain.[24]

Conclusion

Only 9.2% participants scored a high value regarding 'attitude and knowledge' towards insulin therapy, whereas 82.3% demonstrated an inadequate level of knowledge regarding insulin therapy.

Active and continuing education directed towards insulin therapy may increase the acceptance of diabetic individuals to the treatment and, therefore, may prevent complications. Education programmes should be organised according to level of education of diabetic patients.

An increase in the number of planned-training programmes available after diagnosis would be beneficial in guiding healthcare professionals in the area of insulin therapy which would in turn benefit diabetic patients.

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