Diabetes Knowledge among Patients with Diabetes Mellitus at King Hussein Hospital

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ABSTRACT

Objective: To assess Diabetes Knowledge among patients with Diabetes mellitus at King Hussein Hospital.

Method: This study was conducted at King Hussein Hospital. Descriptive research design during the period between September 2010 to October 2010, was used to recruit a convenient sample of 100 hospitalized adult patients with Diabetes mellitus. Data was collected through face-to-face interview using the Brief Diabetes Knowledge Test (Fitzgerald *et al,* 1998). This test is composed of 23 multiple choice questions that assess General Knowledge and Insulin Knowledge as well as Total score for Total knowledge. Simple descriptive statistics (frequency, mean, percentage) was used to describe the study variables

Results: One hundred diabetic patients participated in this study (50 men and 50 women). Their age ranged from 19 to 86 years (mean ±SD 57.8 ± 10.9 years). The majority (90%) were married. The overall scores of the total sample were low; Total knowledge was (49.8 ± 13.4); General Diabetes Knowledge was (54 ± 14) and Insulin Knowledge was (43 ± 19.6). Men scored higher than women in the total Knowledge (52.9 vs. 46.7); General Diabetes Knowledge (56.8 vs. 51.1); and Insulin Knowledge (46.9 vs. 39.8). Moreover, there were no differences found between patients with type 1 and type 2 Diabetes in study group.

Conclusion: Diabetic patients in this study had Diabetes Knowledge deficit about their disease, which in turn will limit their involvement in the management of the disease.

Key words: Diabetes mellitus, Diabetes knowledge, King Hussein Medical Center.

Introduction

Diabetes mellitus (DM) is a common chronic metabolic disorder with increasing prevalence in Jordan and globally. The global number of individuals with DM in 2000 was estimated to be 171 million (2.8% of the world's population), a figure expected to increase in 2030 to 366 million (6.5% of the World's population), about 81.4% of whom will live in developing countries.[1] In 2004, approximately 400.000 (15%) Jordanian adults were reported to have DM (an increase from 7% in 1996), and an estimated 350.000 (12%) had impaired fasting glucose.[2,3] Moreover, there is increased prevalence of type 2 diabetes in Jordan from 12.9% in 1994 to 17.4% in 2004.[4]

Proper management requires life style changes and adequate Diabetes Knowledge of which is considered a key component of diabetes management. Differences in knowledge level have been described depending on level of education, gender and social classes. This study was conducted to assess Diabetes Knowledge among patients with Ddiabetes mellitus at King Hussein Hospital.

Method

This study was conducted at King Hussein hospital, which is a tertiary referral military hospital and part of King Hussein Medical Center, Amman-Jordan, between September 2010 to October 2010. Descriptive research design was used to recruit a convenience sample of 100 hospitalized patients with Diabetes mellitus (DM), 50 (50%) men and 50(50%) women. Inclusion criteria were patients diagnosed with DM type 1 or 2, who agreed to participate (oral consent), age 18 years or more, and had no speech or hearing difficulties. The study was approved by the Ethical Committee of the Royal Medical Services in Jordan 2010.

Data were collected from participant via face to face interview by one of the authors. The tool used consists of two parts; the first part consists of demographic data (gender, height, body weight, occupation, education level, associated diseases, type of treatment, and duration of diagnosis) and the second part is the brief Diabetes Knowledge test using the model designed by Fitzgerald[5] that was translated to Arabic language. The brief Diabetes Knowledge test is composed of 23 multiple choice questions; the first 14 questions assess general DM Knowledge and the last 9 questions assess Insulin Knowledge, reliability of the original test was supported and coefficient ≥ 0.70.[5]

Sample was divided according to gender, type of (DM), duration of diagnosis, age and level of education. Scores were calculated for total knowledge, general DM knowledge and insulin knowledge.

Data Processing and Statistical Analysis

Data were analyzed by using Statistical Package for Social Science (SPSS) version 16. Descriptive statistics in terms of mean, standard deviation and frequencies were used. Furthermore, independent t test was used to compare the means of two groups and one way Analysis of variance (ANOVA) was used to compare the means of more than two groups.

Patient who correctly answered 12 (50%) question or more were considered as passing the test and considered to have acceptable knowledge.

Results

One hundred hospitalized diabetic patients, 50 (50%) men and 50 (50%) women. Mean age ± (SD) was 57.81± (10.98) years. Ninety - one (91%) of the patients were married, 6 (6%) were widows /divorced, and 3 (3%) were singles. Eighty- one percent had secondary school education of 12 years or less; 12% obtained higher diploma and 7 (7%) have university degree as shown in Table I.

Seventy- four subject have at least one associated disease, 36(48.6%) of them had coronary artery disease, 2 (2.7%) had renal disease, and 36 (48.6%) had other diseases as shown in Table I.

Forty- eight (48%) of the sample were on insulin 32(32%) on oral hypoglycemic agents, 8(8%) on combined insulin and hypoglycemic agents and 12(12%) were on diet (Table I).

General DM knowledge for total sample was (54 ± 14.0), insulin knowledge was (43 ± 19.4) and total DM knowledge (49.8 ± 13.3).

Table I: Demographic characteristics and type of Diabetes treatment.

Demographic data	Number (%)
Gender	
Male	50 (50)
Female	50 (50)
Age in years	
19-40years	6 (6)
41-50 years	19 (19)
51-65 years	51 (51)
> 65 years	24 (24)
Education level	
Secondary or less≤12years	81 (81)
Diploma	12 (12)
University or more	7 (7)
Type of treatment	
Insulin	48 (48)
Oral hypoglycemic agents	32 (32)
Insulin and oral (combined)	8 (8)
Diet	12 (12)
Duration of diabetes	
≤ 5years	30 (30)
6-10 years	15 (15)
11-15 years	17 (17)
> 15 years	38 (38)
Marital status	
Married	91 (91)
Single	3 (3)
Widow/divorced	6 (6)
Associated disease	
Coronary heart disease	36 (36)
Renal disease	2 (2)
Other disease	36 (36)
No associated disease	26 (26)

Table II: Comparison between mean knowledge scores according to demographic data and diabetes knowledge *(p < 0.05)

	General DM knowledge Mean score (±SD)	Insulin knowledge Mean score (±SD)	Total DM knowledge Mean score (±SD)
Total Sample	54.0 ± 14.0	43.3 ± 19.6	49.8 ± 13.3
Gender			
Male	56.85 ± 13.73*	46.88 ± 17.57	52.95 ± 11.77*
Female	51.14 ± 14.2	39.77 ± 21.06	46.69 ± 14.21
Age groups			
19-40years	53.62 ± 12.79	55.95±13.86	50.00±15.31
41-50 years	54.69 ± 11.71	57.89±13.44	49.70±14.98
50-65 years	49.95 ± 12.30	55.18±12.46	41.83±21.15
>50years	44.74 ± 16.67	47.91±16.51	39.81±19.90
Type of diabetes			
Type1 DM	53.18 ± 13.81	46.42 ± 20.11	50.54 ± 13.20
Type 2 DM	55.03 ± 14.41	39.39 ± 18.47	48.91 ± 13.65
Duration of diabetes			
≤ 5 years	47.24 ± 11.34	50.71 ± 12.20	41.85 ± 15.62
6-10 years	53.62 ± 12.03	59.52 ± 12.85	44.44 ± 20.57
11-15 years	47.56 ± 16.37	53.78 ± 15.59	37.90 ± 23.26
>15 years	51.37 ± 13.39	54.51 ± 14.89	46.49 ± 20.48
Education level			
≤12 years	53.26 ± 14.55	41.83 ± 20.28	48.79 ± 13.73
Higher education	57.14 ± 11.41	49.70 ± 15.43	54.23 ± 10.88

Diabetes Knowledge Scores by Gender:

General DM knowledge for men was (56.9 ± 13. 4) and (51.1 ± 14.2) for women (t= 2.07; p*=0.041), insulin knowledge was (46.9 ± 17.6) for men and (39.8 ± 21.1) for women (t=1.83; p=0.07) and total DM knowledge was (52.9±11.8) for men and (46.7±14.2) for women (T=2.4; P*=0.018), as presented in Table II.

Diabetes Knowledge Scores by Type of DM Management:

General DM knowledge was (53.2 ± 13.8) for type 1 and (55.0 ± 14.4) for type 2 DM, insulin knowledge was (46.4 ± 20.1) in type 1 and (39.4 ± 18.5) in type 2 and total DM knowledge was (50.5 ± 13.2) in type 1 and (48.9 ± 13.7) in type 2 (Table II). Using independent t test showed that there were no statistically significant differences found between types of DM for all knowledge types (t = 0.60; p = 0.55 for total diabetes knowledge, t = 0.65; p = 0.52 for general diabetes knowledge, and t = 1.8; p = 0.07 for insulin knowledge). Although the scores of knowledge about insulin was better among patients who were using insulin than those who were only on oral hypoglycemic or on diet alone, but the differences were not statistically significant.

Diabetes Knowledge Scores by Level of Education:

Independent t-test revealed that there were no statistically significant differences of diabetes knowledge scores between levels of education.

General DM knowledge was (53.26 ± 14.55) for those who have ≤ 12 years of education and (57.14 ± 11.41) for patients who have > 12 years of education (t = 1.09, p = 0.28), insulin knowledge was (41.83 ± 20.28) for those who had ≤12 years of education and (49.70 ± 15.43) for those who had > 12 years of education (t = 1.58, p = 0.12), and total DM knowledge (48.79 ± 13.73) for those with ≤ 12 years of education and (54.23±10.88) for those with >12 years of education (t = 1.61, p = 0.11), Table II.

Diabetes Knowledge Scores According to the Duration of DM Diagnosis:

General DM knowledge for patient diagnosed with DM ≤ 5 years from time of diagnosis was (47.24 ± 11.34) insulin knowledge was (50.71 ± 12.20) and total DM knowledge was (41.85 ± 15.62). General DM knowledge for patient diagnosed with DM from 6-10 years was (53.62 ± 12.03), insulin knowledge was (59.52 ± 12.85) and total DM knowledge was (44.44% ± 20.57).

General DM knowledge for patient diagnosed with DM from 11-15 years was (47.56 ± 16.37); insulin knowledge (53.78 ± 15.59) and total DM knowledge was (37.9 ± 23.26). General DM knowledge for patient diagnosed with DM for more than 15 years was (51.37 ± 13.39), insulin knowledge was (54.51 ± 14.89) and total DM knowledge was (46.49 ± 20.48), Table II. One way ANOVA test revealed that there were no statistically significant differences in diabetes knowledge scores according to the

duration of DM diagnosis in general diabetes knowledge (F = 1.35; p = 0.26), insulin knowledge (F = 0.83; p = 0.35) and total knowledge scores (F = 1.11; p = 0.35).

Diabetes Knowledge Scores According to Age:

General DM knowledge for patients (19-40 years) was (53.62 ± 12.79), insulin knowledge was (55.95 ± 13.86), and total DM knowledge was (50.0 ± 15.31). General DM knowledge for patients (41-50 years) was (54.69 ± 11.71), insulin knowledge was (57.89 ± 13.44), and total DM knowledge was (49.70 ± 14.98). General DM knowledge for patients (51-65) was (49.95 ± 12.30), insulin knowledge was (55.18 ± 12.46), and total DM knowledge was (41.8 ± 21.15). General DM knowledge for patients (>65years) was (44.74 ± 16.67), insulin knowledge was (47.91 ± 16.51), and total DM knowledge was (39.81 ± 19.9), Table II. One way ANOVA test revealed that there were no statistically significant differences between age groups of the patients in general diabetes knowledge (F=2.23; p = 0.09), insulin knowledge ((F=1.27; p = 0.29), and total diabetes knowledge (F=2.24; p = 0.088).

Discussion

The overall scores of the total knowledge in this study were low. Total knowledge was (49.8±13.4), general diabetes knowledge was (54±14) and insulin knowledge was (43±19.6), (Table II). Men scored higher than women in the total knowledge (52.9 vs. 46.7), general diabetes knowledge (56.8 vs. 51.1) and insulin knowledge (46.9 vs. 39.8). However, there were no statistically significant differences between patients with type 1 and type 2 diabetes, the level of education, the duration of diabetes, and age of the patient in the general diabetes knowledge, insulin knowledge, or the total knowledge.

The findings of this study were consistent with the findings of Al-Aldsani et al study[6] who used same tool. They found that knowledge deficit was related to low literacy rates, low family income and low self care. Moreover, these findings were supported by Kheir et al[7] who indicated that diabetic patients had low score of knowledge about their disease, (Table III). Another study conducted in Jordan[8] reported that the knowledge about diabetes and periodontal health among diabetic patients was low; these findings also provided additional support to the findings of the present study.

Men achieved significantly higher in knowledge score than women and this finding was consistent with many other studies done in other countries that had similar socio-economic status and literacy levels of subjects. [9-15]

Women were less aware than men mostly due to low literacy rates among women in this part of the world.[9] In contrast to our study regarding gender differences, Gonzalez et al and Modeley et al[16,17] found that men were having significantly less knowledge about diabetes than women. The discrepancy of the findings of these studies and the findings of the present study might be attributed to the differences of the patients' populations.

When the findings of the present study were compared with Mccleary et al[18] which used Michigan diabetes knowledge test, they found a higher score of knowledge than in our study due to the fact that their population received diabetes education and higher literacy rates as 81% of our sample had secondary school or less than 12 years of education (low literacy).

Good relationship between patient and health care is of extreme importance and achieve a good adherence to therapy and increase diabetic knowledge. The relationship of the patient with doctor and family member seems to have an impact on diabetes knowledge as was shown in Al Qazaz study.[19]

Knowledge deficit appeared in most studies discussed and summarized in Table III emphasized the need for diabetes education program which is essential in improving diabetes knowledge which is regarded a key component of diabetes management and improvement of quality of life.

Limitations of the study

Involves the use of small sample which limits generalization of the findings of the study. Larger sample is needed in future research. Additionally, another limitation that the sample of the present study was restricted to hospitalized diabetic only, which might make the sample not truly representative of the over- all general ambulatory diabetic patient population whose health care is mainly conducted in outpatient clinics without being hospitalized. Recruiting sample from inpatient and outpatient clinics will enhance the generalisability of the findings of future studies.

Table III: Summary of studies and comparison of data with international studies of diabetes knowledge

Author and year	Sample size	Tool	Result
Adsani AMS, et al [6] 2009 (Kuwait)	5114	Michigan diabetes knowledge test	Mean total knowledge score was 58.9%. Poor knowledge.
Kheir Net et al [7] 2011 (Qatar)	54	Diabetes habits and believes questionnaire	Mean total knowledge score was 50.7% ± 18.9; the patients' knowledge of diabetes was relatively poor.
Al Habashneh R, et al [8] 2010 (Jordan)	405	A questionnaire	48% DM patient know that they have more risk for gum disease and oral health complication and 38% know that their periodontal health might affect their glycemic control.
Rafigue G, et al [9] 2006 (Karachi, Pakistan)	199	Structured questionnaire on knowledge believes and practices regarding diabetes.	48.2% poor knowledge, 38.2% acceptable knowledge and 13.6% good knowledge.
Upadhyay DK, et al [10] 2007 (Nepal)	182	Knowledge, Attitude and practices questioners developed by researcher	Knowledge score was 4.90 ± 3.34 with maximum score for knowledge 18. The knowledge score of the patient was low.
Sabri AA, et al [11] 2007	240	A questionnaire	Mean awareness among rural 13 ± 2 and for urban18 ± 2 .Maximum score 25.
Mcpherson ML, et al [12] 2008	44	Diabetes medication knowledge questionnaire	Patients diabetes knowledge score from 1 to 7 medium score 5. Their was strong relationship between A1c and knowledge scores P=<.001 A1c was one –half unit decrease with each one unit increase in knowledge scores among men. Among women A1c was 1.6 unit decreases for each one unit increase in knowledge scores.
Maina WK, et al [13] 2010 (Kenya)	1892	A medium - sized four part questionnaire was designed by researcher.	29% have good knowledge and 71% have poor knowledge.
Badruddin N, et al [14] 2002	100	A questionnaire to assess diabetic knowledge	Overall diabetes knowledge was not very good: 54% poor knowledge, 34% fair knowledge, and 13% good knowledge.
Ardena GJ, et al [15] 2010 (Philippines)	156	Investigator-administered questionnaires and focus group discussions	Overall score of knowledge was low 43%.
Gonzalez HM, et al [16] 2009	3899	A modified Andersen model of health care access.	Latino group were found with Mexican American having the lowest rate usual sources of health care (59.7%).Usual sources of health care were associated with significantly higher diabetes awareness and knowledge (OR=1.24; 95% CI=1.05 - 1.46). Diabetes awareness and knowledge 18.16 low, 44.2 moderate and 37.6 high. Men were significantly (OR=0.64; 95% CI=0.52 - 0.75) less informed about diabetes than women.
Moodley LM, et al [17] 2007.(India)	181	A modified version of Michigan brief diabetes knowledge test.	Total passed the diabetic knowledge test was 66.9%. Pass of the female was 69.8% comparing to male 60%. Pass by the India 75.9% better than African patient 52.2%.
Mccleary JV, et al [18] 2011	50	Knowledge measured by diabetes knowledge test (Fitzgerald et al, 1998).	Mean score of knowledge was 65.1% (range 17.39-92.85)
Al-Qazaz HK, et al [19] 2009 (Malaysia)	12	Semi - structured interview guide regarding adherence of patient to medication and factor affecting it.	Knowledge about medication and disease was moderate.

Author and year	Sample size	Tool	Result
Bruce DG, et al[20] 2003	1264	A validated 15 question self administered questionnaire.	The result indicated subject who had not participated in any self care behavior (education, dietitian and serum monitoring of blood glucose SMBG) had significantly lower knowledge score than all other groups except those who had attended dietician alone p=<0,01 and subject who had attended all three activities had significantly higher score than who had attended no activities, only one of three activities or combination of dietitian and(SMBG) P=0,001
Yun LS, et al[21] 2007 (Malaysia)	120 diabetes and 120 healthy people.	Validated questionnaire	The overall finding of this study indicates that there was more awareness and knowledge among patient with diabetes. Mean total knowledge of diabetes was 24.4 ± 3.83 vs. 20.2 ± 5.97 for healthy person, maximum 30.

Conclusion and Recommendations

Diabetic patients in this study had Diabetes Knowledge deficit about their disease, which in turn will limit their involvement in the management of the disease.

Health care provider should focus on improving patients' knowledge about diabetes via diabetes education by doctor, nutrition clinic for outpatient and dietary counseling for inpatient and via nursing specialized in diabetes to train patients about self monitoring blood glucose and self insulin injection.

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