

Original Research Article

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## Satisfaction Assessment among Type 2 Diabetic Patients at Tanta University Hospitals, Egypt

Eman Ali Younis<sup>1\*</sup>, Nessreen Ahmed Kotb<sup>2</sup>, Ali Ali Elsherbiny<sup>1</sup>,  
Abdel Aziz Farouk El Dieb<sup>1</sup> and Nehalsalah Shehab<sup>1</sup>

<sup>1</sup>Public Health and Community Medicine, Faculty of Medicine Tanta University, Egypt

<sup>2</sup>Internal medicine, Faculty of Medicine Tanta University, Egypt

\*Corresponding author

### ABSTRACT

Diabetes mellitus is a major contributor to morbidity and mortality worldwide. Identification of patient requests, needs and judgment on health care received is the starting point of patients centered approach; therefore patient satisfaction is considered as important measure to evaluate the quality of health services and can predict both compliance and utilization that associated with the continuity of care. 1. Assess type 2 diabetic patients' satisfaction with the provided care at Tanta University Hospitals. This study was cross sectional one carried-out in the internal medicine hospital at Tanta University Hospital. The study subjects included; 245 admitted type 2 diabetic patients. Tools of the study; A validated patient satisfaction questionnaire -18 was used to assess the satisfaction with the provided care. The majority of the studied patients were satisfied regarding general satisfaction and time spent with doctor subscale, more than three quarters were satisfied regarding technical quality and accessibility subscale, most of the studied patients (91.8%) were satisfied regarding interpersonal manner, and less than two thirds (62.4%) were satisfied regarding communication. As regard financial aspects, only 35.5% were satisfied. The total satisfaction level among the studied patients was high.

#### Keywords

Diabetes, Type 2,  
Quality,  
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### Introduction

Diabetes mellitus (DM) is one of the major non-communicable diseases with a dramatically increasing prevalence in both the developed and the developing world. The Middle East region has seen some of the largest growth in DM in the world; five out of the top 10 countries with the highest diabetes prevalence are in the Middle East region, and trends predict that the region will see over

90% growth in the disease by 2030. These perturbing trends are a result of the dramatic changes in dietary and lifestyle habits in this rapidly economically developing region (Bener, Al- Hamaq *et al.*, 2014).

In the Middle East and North Africa (Mena) region, almost 37 million people have diabetes and are expected to rise to 68 million by the year 2035. It was estimated that 1 in 10 adults have diabetes and that diabetes was expected

to cause 363,000 deaths in 2014. Fifty-three percent of those deaths will be under the age of 60 years (Ahmad, Elnour *et al.*, 2015).

Christian Bommer and colleagues reported that the cost of diabetes worldwide was US\$1.31 trillion, or 1.8% of the global gross domestic product (GDP), in 2015. Their study of the global economic burden of diabetes showed that two thirds of these total costs were direct medical costs (\$857 billion) and one third were indirect costs, such as lost productivity (Zhang and Gregg, 2017).

Quality assessment in chronic disease has become increasingly widespread, with published quality measurement sets in conditions as diverse as diabetes, cardiac diseases, stroke, and cancer. The criteria for selecting conditions for quality assessment include mortality and morbidity burden, variation in care (performance gaps), and the evidence for effective care (process-outcome link) (Kanwal 2014).

Patients' satisfaction is considered an important source of information about the quality of care as a consumer assessment and it has been shown to be associated with positive outcomes, reduced disease cost and better health. It reflects the health plans, health systems and the process of care. Emphasizing the role of the patients and their rights to be exposed to information and treatment plans are important elements of quality of care. Patient satisfaction regarding diabetes services is indirectly used to assess the quality of the health care system (Balla, Shaaban *et al.*, 2016).

### **Subject and Methods**

A cross-sectional study was carried-out in the Internal Medicine Hospital (endocrinology unit) at Tanta University Hospital (TUH). This hospital is a teaching and referral hospital

providing health services to the population of Tanta and other neighboring rural and urban areas. Personal interview with the selected admitted type 2 diabetes patients who admitted to T.U.H during the study period to assess their satisfaction. Patients were eligible for inclusion if they were aged  $\geq 18$  years, had a history of at least one visit for follow up at outpatient clinic of Tanta University Hospitals in the last year and who had been diagnosed for type 2 diabetes for 1 year and more. Exclusion criteria were; cases with duration of onset of diabetes less than one year, age less than 18 years, gestational diabetes cases, cases with no history of follow up in the outpatient clinic of T.U.H, and type 1 diabetes.

The sample of this study was a purposive one. The sample size was calculated using Mini tab statistical program version 16. The minimum sample size was calculated for single proportion of uncontrolled diabetes to be 245 file during one year duration putting into consideration that the power of the test was 95%, comparative probability 38.6% (for uncontrolled diabetes) (Elaziz, Nour-Eldin *et al.*, 2014) and hypothesized probability from pretest study 50% (10 files out of 20).

### **Tools of the study**

A validated patient satisfaction questionnaire - 18 was used to assess the satisfaction with the provided care by using the Arabic version and revalidation was done by making double translation of the questionnaire.

### **Statistical design**

Data was presented and statistically analyzed by using SPSS-V19 (statistical package for social version 19). Numerical data was presented as mean and standard deviation (SD) and categorical data was presented as number and percentage. Chi-squared test was used for statistical analysis. When the chi-

squared test was not appropriate, the likelihood ratio test was applied. The level of significance was adopted at  $p < 0.05$ .

### **Ethical consideration**

Ethical considerations of the study were carried out according to that of the ethical committee of Tanta Faculty of Medicine and written consent was obtained from every patient.

### **Results and Discussion**

The patients ages ranged from 31-72 years with mean of  $53.1 \pm 9.4$  years. More than two-thirds (70.6%) were females and more than four fifths (82.1%) were illiterate and primary educated. About one fifth (20.8%) of them were working as daily labors (Table 1). The duration of diabetes since diagnosis ranged from 1-30 years with mean of  $12 \pm 7.5$  years, 75.5% were treated by insulin and 18 % were treated by oral hypoglycemics plus insulin and three-quarters (74.3%) of them had one monthly follow-up visit and 19.2% had one visit every two months. The most common complications among them were neuropathy followed by retinopathy and diabetic foot (86.9%, 56.3% and 31% respectively). More than two-thirds of the patients (67.8%) were hypertensive. About one eighth (12.7%) were currently smokers (Table 2).

Slightly more than four fifths (80.4%) were satisfied regarding general satisfaction subscale, more than three quarters (77.1%) were satisfied regarding technical quality, most of the studied patients (91.8%) were satisfied regarding interpersonal manner, and less than two thirds (62.4%) were satisfied regarding communication. As regard financial aspects, only 35.5% were satisfied. Under time spent with doctor and accessibility subscales, more than four fifths (85.3%) and 78.8% were satisfied respectively (Table 3).

Statistically significant relationship between age and the total satisfaction level ( $P=0.003$ ), as satisfaction level was 97.2% among the older age group compared to 83.3% among the younger age group. Also statistically significant relationships were detected between gender and educational level from one side and the total satisfaction level from the other side ( $P=0.009$  and  $0.014$ ) respectively. Most of females (93.1%) were satisfied compared to 88.9% for males and satisfaction was highest (97%) among illiterate patients (Table 4). Most of uncontrolled patients had higher satisfaction level compared to controlled patients with statistically significant relationships between all the outcome measures and total satisfaction level of the studied diabetic patients. Regarding glycemic control; 94.4% of uncontrolled patients were satisfied compared to 80.0% among controlled patients. The same results were attained for all the outcome measures (Table 5).

The current study showed a high level of the overall patient satisfaction (91.8%) (Table 3). In agreement, Ghazwani *et al.*, (2014) in Saudi Arabia reported that, 87% of the studied diabetic patients were satisfied (Ghazwani and Al Jaber 2014). Other studies by Othman *et al.*, in Dubai (2015), Allan in Australia (2009), AL Eisa *et al.*, in Kuwait (2005), and Gad Allah *et al.*, in Egypt (2003) reported that the overall patient satisfaction ranged between 98% and 99.6% (Gadallah, Zaki *et al.*, 2003, Al-Eisa, Al-Mutar *et al.*, 2005, Allan, Schattner *et al.*, 2009, Othman, Hussein *et al.*, 2015). While Al Emadi *et al.*, in Qatar (2009) and AL Faris *et al.*, in Saudi Arabia (1996) reported lower overall patients' satisfaction 75.2 % and 64.2% respectively (Al-Faris, Khoja *et al.*, 1996, Al Emadi, Falamarzi *et al.*, 2009).

This high level of patients' satisfaction in the present study mostly explained by; patients were not concerned about the quality of their

doctors' technical skills and the majority of the patients responded favorably to most items of the questionnaire saying "all people in the unit are good", mentioned that their satisfaction is related to the behavior of doctors and nurses rather than their concern about the relief from pain and solution to their medical problems.

Considering patient satisfaction subscales, the current study showed, the interpersonal manner had the highest satisfaction score (91.8%) (Table 3). In agreement, Margolis *et al.*, in UAE (2003) found humanness domain got the highest score in the domains of satisfaction (Margolis, Al-Marzouqi *et al.*, 2003).

Similarly, Othman *et al.*, in Dubai (2015) found that humanness of the staff subscale of satisfaction got high score (99.25%) (Othman, Hussein *et al.*, 2015).

The current study revealed that, time spent with doctor also had high satisfaction score (85.3%) (Table 3). Peyrot *et al.*, (2006) studied patient and provider perceptions of care for diabetes in a multicenter study from Asia, Australia, Europe and North America and reported that, time spent with doctor was rated high by patients in all countries (Peyrot, Rubin *et al.*, 2006).

Accessibility is one of the principles of health for all, as stated in the Alma Ata declaration on primary health care in (1978). It has been reported that accessibility is the strongest predictor of overall satisfaction with quality of health care (Yingtaweesak, Yoshida *et al.*, 2013).

The current study revealed that more than three quarters of patients (78.8%) were satisfied with the accessibility of the services (Table 3). This was in concordance with Peyrot *et al.*, (2006) who reported in his study

that, patient-reported ease of access to providers was rated high (mean=77%, range=65%–84%), with Scandinavia and the Netherlands rated significantly lower than the overall mean while Australia and France were rated significantly higher (Peyrot, Rubin *et al.*, 2006).

While in Qatar a study done by Al Emadi *et al.*, (2009) reported that accessibility of the services got the highest score on domains of satisfaction (Al Emadi, Falamarzi *et al.*, 2009). Another study in Dubai (2015) also reported very high level of satisfaction (95.29%) regarding the accessibility (Hussein 2015).

The present study also reported that, more than three quarters (77.1%) were satisfied with technical quality (Table 3). In contrast to present result, Othman *et al.*, in Dubai (2015) found that, the effectiveness of service got the highest score (99.63%+1.55) (Othman, Hussein *et al.*, 2015). The least scores in the current study were recorded for financial aspect of the care and communication (35.5% and 62.4% respectively) this may be due to low socio economic status of the study subjects for the first subscale.

Some problems were encountered by patients such as difficulties in; follow up with same physician each time, referring system as well as difficulties if the patient missed the appointment (no call back from the clinic).

Peyrot *et al.*, (2006) studied patient and provider perceptions of care for diabetes in a multicenter study and found that Patient-reported financial barriers to care varied across nations (mean=26%, range=9%–64%), with several European Union countries having significantly lower financial barriers and the USA, Poland and India having significantly higher financial barriers (Peyrot, Rubin *et al.*, 2006).

**Table.1** Socio-demographic characteristics of the studied diabetic patients

Socio-demographic data	Studied diabetic patients(N=245)	
	N	%
<b>Age (years):</b>		
(30-<40)	24	9.8
(40-<50)	78	31.8
(50-<60)	100	40.8
(60-)	43	17.6
<b>Range</b>	31-72	
<b>Mean <math>\pm</math>SD</b>	53.1+9.4	
<b>Gender:</b>		
Female	173	70.6
Male	72	29.4
<b>Educational level:</b>		
Illiterate	133	54.3
Primary	68	27.8
Secondary	32	13.1
University	12	4.8
<b>Employment:</b>		
Daily labor	51	20.8
Not working/ house wife	194	79.2

**Table.2** Diabetic and smoking history of studied diabetic patients

Diabetic and smoking history	Studied diabetic patients(N=245)	
	n	%
<b>Duration since diagnosis (years):</b>		
(1-<5y)	59	24.1
(5-10y)	71	29.0
(>10y)	115	46.9
<b>Range</b>	1-30	
<b>Mean <math>\pm</math>SD</b>	12 $\pm$ 7.5	
<b>Median</b>	10	
<b>Type of treatment:</b>		
Oral hypoglycemic drugs	16	6.5
Oral plus insulin	44	18.0
Insulin	185	75.5
ACEIs/ ARBs	91	37.1
Statin/lipid control	128	52.2
ASA/antiplatelet	75	30.6
<b>Compliance with antidiabetic treatment:</b>		
Yes	162	66.1
To some extent	83	33.9
<b>Frequency of follow-up visits:</b>		
Weekly	8	3.3
Twice monthly	8	3.3
Monthly	182	74.3
Every 2 months	47	19.1
<b>Complication:<sup>a</sup></b>		
Neuropathy	213	86.9
Nephropathy	52	21.2
Retinopathy	138	56.3
Diabetic foot	76	31.0
<b>Co –morbidity:(Hypertension)</b>	166	67.8
<b>Previous admission:</b>		
No	103	42.0
Yes	142	58.0
<b>Cigarette smoking:</b>		
Non smokers	199	81.2
Ex-smokers	15	6.1
Currently smokers	31	12.7

<sup>a</sup>categories aren't mutually exclusive.

(ACEIs): angiotensin converting enzyme inhibitors/ (ARBs) angiotensin receptor blockers {antihypertensive}  
 (ASA): Acetyl salicylic acid

N.B: diet therapy was not presented among the studied patients.

**Table.3** Total satisfaction level and its main subscales among studied diabetic patients

Satisfaction subscales	Satisfaction level (N=245)					
	Dissatisfied		Neutral		Satisfied	
	n	%	n	%	n	%
General satisfaction	12	4.9	36	14.7	197	80.4
Technical quality	32	13.1	24	9.8	189	77.1
Interpersonal manner	8	3.3	12	4.9	225	91.8
Communication	8	3.3	84	34.3	153	62.4
Financial aspects	48	19.6	110	44.9	87	35.5
Time spent with doctor	20	8.2	16	6.5	209	85.3
Accessibility and convenience	28	11.4	24	9.8	193	78.8
Total satisfaction	16	6.5	4	1.6	225	91.8

**Table.4** Relationship between total satisfaction level and socio-demographic characteristic of studied diabetic patients

Socio-demographic data	Total satisfaction level of studied diabetic patients (N=245)						
	Dissatisfied (n=16)		Neutral (n=4)		Satisfied (n=225)		MCET** P
	n	%	n	%	n	%	
Age (years):							.003*
(30-<40)	4	16.7	0	0.0	20	83.3	
(40-<50)	8	10.3	4	5.1	66	84.6	
(≥50-)	4	2.8	0	0.0	139	97.2	
Gender:							.009*
Female	12	6.9	0	0.0	161	93.1	
Male	4	5.6	4	5.6	64	88.9	
Educational level:							.014*
Illiterate	4	3.0	0	0.0	129	97.0	
Primary	8	11.8	4	5.9	56	82.4	
Secondary/University	4	9.1	0	0.0	40	90.9	
Employment:							.686
Daily labor	0	0.0	0	0.0	12	100.0	
Not working/ house wife	16	6.9	4	1.7	213	91.4	

\*\*MCET: montcarlo exact test

\*Significant ( $P \leq 0.05$ ).

**Table.5** Relationship between total satisfaction level and outcome of studied diabetic patients

Outcome	Total satisfaction level of studied diabetic patients (N=245)						MCET** P
	Dissatisfied (n=16)		Neutral (n=4)		Satisfied (n=225)		
	n	%	n	%	n	%	
<b>Last glycemc control:</b>							.002*
Controlled (A1C<6.5g/dl)	8	20.0	0	0.0	32	80.0	
Inadequate control(A1C6.5-<9.5g/dl)	4	3.6	4	3.6	102	92.7	
Poor control(AIC>9.5g/dl)	4	5.6	0	0.0	67	94.4	.007*
<b>Last systolic blood pressure:</b>							
Controlled (<130mmhg)	12	10.1	0	0.0	107	89.9	
Uncontrolled(>130mmhg)	4	3.2	4	3.2	118	93.7	.023*
<b>Last diastolic blood pressure</b>							
Controlled(<80mmhg)	11	9.6	0	0.0	104	90.4	
Uncontrolled(>80 mmhg)	5	3.8	4	3.1	121	93.1	.005*
<b>Lipid profile:</b>							
<b>Last blood cholesterol</b>							
Controlled(<200mg/dl)	12	11.2	0	0.0	95	88.8	.004*
Uncontrolled(>200mg/dl)	4	2.9	4	2.9	130	94.2	
<b>Last triglycerides</b>							
Controlled(<150mg/dl)	12	10.8	0	0.0	99	89.2	.004*
Uncontrolled(>150mg/dl)	4	3.0	4	3.0	126	94.0	

\*\*MCET: montcarlo exact test

\*Significant (P≤0.05).

The current study revealed that, significantly the older ages were more satisfied than younger ones (97.2% versus 83.3%) (Table 4). In agreement, Saeed *et al.*, (2001), Margolis *et al.*, (2003), AL Eisa *et al.*, (2005), Quintana *et al.*, (2006), AL Emadi *et al.*, (2009), and Rahmqvist *et al.*, (2010) found the same results (Saeed, Mohammed *et al.*, 2001, Margolis, Al-Marzouqi *et al.*, 2003, Al-Eisa, Al-Mutar *et al.*, 2005, Quintana, González *et al.*, 2006, Al Emadi, Falamarzi *et al.*, 2009, Rahmqvist and Bara 2010). This finding can be explained as older patient are becoming more familiar with the potential shortcomings in the care delivery system and expecting no more from the current situation with consequent fair satisfaction. However, Bener, *et al.*, (2014) in Qatar detected that, significantly younger patients were more satisfied than older ones (Bener, Al- Hamaq *et al.*, 2014). Other studies reported no association

between age and satisfaction (Baker and Streatfield, 1995; Qatari and Haran, 1999; Alazri and Neal, 2003; Jalil, Zakar *et al.*, 2017). In the present study, females were more satisfied than males (93.1% versus 88.9%) with statistically significant difference (Table 4). This finding seems to be similar to Hargraves *et al.*, (2001), Bu- Alayyan *et al.*, (2008) and Jalil *et al.*, (2017) (Hargraves, Wilson *et al.*, 2001, Bu-Alayyan, Mostafa *et al.*, 2008, Jalil, Zakar *et al.*, 2017). In contrast other studies showed more significant satisfaction among males (Al-Eisa, Al-Mutar *et al.*, 2005, Al-Azmi, Mohammed *et al.*, 2006, Al-Sakkak, Al-Nowaiser *et al.*, 2008). On the other hand, several studies showed no association between overall satisfaction and gender (Baker and Streatfield 1995; Weisman, Henderson *et al.*, 2001; Alazri and Neal 2003, Bener, Al- Hamaq *et al.*, 2014).

The present study showed that, less educated patients were significantly more satisfied than high educated patients (97.0% versus 90.9%) (Table 4). This finding was consistent with the results seen by Jalil *et al.*, (2017) in Pakistan (Jalil, Zakar *et al.*, 2017) and many other studies (Maq, Elzubier *et al.*, 1997; Babić-Banaszak, Kovačić *et al.*, 2001; Niakas, Gnardellis *et al.*, 2004). However, Saeed *et al.*, (2001) showed the opposite results (Saeed, Mohammed *et al.*, 2001). Gadallah *et al.*, (2003) in Egypt and Bener *et al.*, (2014) in Qatar showed that no significant relationship although highly educated patients had a higher satisfaction score compared with less educated patients (Gadallah, Zaki *et al.*, 2003, Bener, Al- Hamaq *et al.*, 2014).

The current study revealed that the satisfaction was none significantly higher among working patients than non-workers (Table 4). This finding was in accordance with Al Eisa *et al.*, (2005) in Kuwait and Quintana *et al.*, (2006) (Al-Eisa, Al-Mutar *et al.*, 2005, Quintana, González *et al.*, 2006). In contrast, Bener *et al.*, (2014) in Qatar found that diabetic patients who had professional jobs were significantly more satisfied than their counterparts (Bener, Al- Hamaq *et al.*, 2014). This could be attributed to patients who had professional jobs had higher income than none workers which enable them to be more committed to physicians' medical requests. However, Jalil *et al.*, (2017) in Pakistan reported that, unemployed patients were significantly high satisfied than the employed patients (Jalil, Zakar *et al.*, 2017).

The relation between satisfaction and outcome of care measures is complex and there is growing evidence linking patient satisfaction with better medical outcome of care. These outcomes include better compliance, and adherence to medical regimens. However, it is equally true that people who receive both good process and good outcome of care are likely to be more satisfied (Hussein 2015). The current study result showed significant association between the uncontrolled diabetes, uncontrolled

blood pressure and uncontrolled lipid profile from one side and patient satisfaction from the other side (Table 5).

In contrary, Boels *et al.*, (2017) studied patient satisfaction in a multicenter study in eight European countries and found that patients with uncontrolled HbA1c levels were significantly associated with lower satisfaction (Boels, Vos *et al.*, 2017).

Also, Bener *et al.*, (2014) in Qatar found that patients with optimum level of HbA1C, total blood cholesterol, triglycerides and blood pressure were significantly more satisfied (Bener, Al- Hamaq *et al.*, 2014). Redekop *et al.*, (2002) in Dutch and Alazri *et al.*, (2003) found that poorly controlled diabetic patients were being less satisfied (Redekop, Koopmanschap *et al.*, 2002, Alazri and Neal 2003). However Al Shahrani and Baraja (2014) in Saudi Arabia found no association between patient satisfaction and HbA1C control (Al Shahrani and Baraja 2014).

However, the difference between the current study and other studies done in that field may be the studied patients were more concerned about the process and quality of the delivered care than the outcome of their illness.

Based on the results of the present study, we can conclude that;

The total satisfaction level among the studied patients was high.

Quality of health care for diabetic patients was also suboptimal.

Glycemic, lipid and hypertension controls among diabetic patients at Tanta university hospitals were below the recommended standards.

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