



Satisfaction of Diabetic Patients Regarding Health Care Services Provided In Some Egyptian Family Health Care Units

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ABSTRACT

Background: Patient satisfaction is considered an important source of information about the quality of care, as it reflects health care planning, health systems, and care processes. **Objective:** To assess satisfaction among diabetic patients attending family health services in Aga District, Dakahlia Governorate, Egypt. **Method:** A cross-sectional study with a comparative component was conducted on a total of 403 diabetic patients who were registered in the selected health facilities of Aga district. A three-part interviewer-administered questionnaire was used to collect data about satisfaction. It covered sociodemographic characteristics, diabetic care, and satisfaction. Patient satisfaction was assessed using a 26-items Satisfaction Diabetes Scale. **Results:** The average age was 54.2 ± 7.3 years and 53.3 % of them are males. The median duration of diabetes among the studied cases was 3 years. Approximately 63% of the patients were on oral hypoglycaemic, 22% on insulin, and 11% on both. Out of 403 patients, 40% have good satisfaction score, 50.9% have fair satisfaction and 9.2% only have poor satisfaction. The following factors were statistically significant predictors for fair to poor satisfaction; urban residence (OR= 1.54), treatment regimen (OR=2.79 & 1.31 for using insulin treatment and oral hypoglycaemic drugs, respectively), and presence of complications (OR=6.89). **Conclusion:** Satisfaction of diabetic patients towards family health care services in the studied centre was suboptimal. Lack of awareness of diabetic complications is a main contributor to the suboptimal satisfaction. Improving patient education and more physician-patient interaction is probably required to improve satisfaction of diabetic patients.

Submission Date:

2023-03-14

Revision Date:

2023-05-05

Acceptance Date:

2023-05-05

Key Words:

Satisfaction, Diabetic Patients, Family Health Care Services.

INTRODUCTION

Diabetes mellitus is one of the major non-communicable diseases with increasing prevalence in developed and developing countries. In Egypt, diabetes mellitus (DM) is an important public health problem, and the disease is considered a modern pandemic worldwide. It is one of the top 10 causes of death in the world. The prevalence and prevalence of diabetes are increasing and represent a significant health and economic burden, with a prevalence of 15.2%. Egypt is a member of the Middle East and North Africa (MENA) Region of the Israeli Armed Forces. The IDF estimates that the number of people

with diabetes in the MENA region will double to 108 million by 2045. Although 40-50% of people with diabetes or pre-diabetes are undiagnosed, these numbers appear to be very high. Egypt's diabetic numbers he is expected to reach by 2035.^{1,2}

Healthcare systems are constantly changing and improving, so there is a need to figure out how to measure outcomes while also measuring recipient satisfaction. Patient satisfaction is a patient's response to some aspect of their service experience.³

Because patient satisfaction can be influenced by the quality of healthcare, patient experience is one of the

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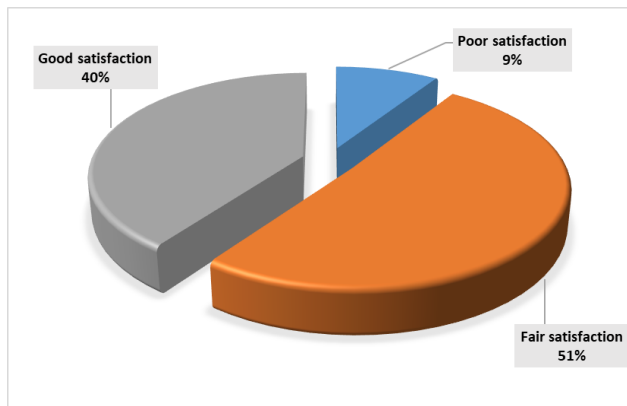


Figure (1): distribution of the studied cases according to satisfaction scale

fundamental determinants of quality of care and an important source of information about the quality of care. The patient's voice must play a greater role in the design of healthcare processes. Care is evaluated by consumers and shown as relevant to outcomes. Plus, lower healthcare costs, and better health. It reflects health planning, health systems, and care processes. Emphasize the patient's role and right to information and treatment planning as a key component of quality care. Patient satisfaction with diabetes services is used indirectly to assess the quality of the healthcare system.^{4,5}

Satisfaction is not only related to system difficulties but also to patient characteristics and the disease also plays a role. There is an excellent association between satisfaction and patient characteristics such as; age, sex, education, nationality, and occupation. Disease characteristics such as duration of illness, complications, type of treatment, and disease control are also related to satisfaction.⁶

A previous study was carried out in Tanta, Egypt to assess the satisfaction of diabetic patients attending university hospitals and found that the satisfaction level among diabetic patients was high; so our study was carried out to assess the level of satisfaction also in primary health care services. The overall aim of this study is to assess satisfaction among diabetic patients attending family health services in Aga District, Dakahlia Governorate.

METHOD

A cross-sectional study with a comparative component was conducted on a total of 403 diabetic patients. The study was conducted in the Aga district, Dakahlia governorate. This district includes 36 family health

units and a single hospital in an urban setting. According to the health files of the Aga directorate for the year 2020- 2021, these health facilities served about 4298 diabetic patients in rural settings and 2980 in urban ones. Aga Central Hospital was included to cover the urban family health services versus 3 rural family health units (Shiwa, Samaha, and Sahrageh Elsoghra Health Units) to represent the rural settings. Inclusion criteria; diabetic patients aged more than 18 years, both sexes were included. Exclusion criteria were cases who refused to share in the study and those out of included age range.

The study was conducted during the year 2021-2022. To estimate the required sample size in this study, the prevalence of diabetic patient satisfaction was taken as a primary outcome of interest with considering the reported satisfaction rate in a previous Egyptian study⁷ using the Daniel equation:

$n = Z^2 p (1-p) / d^2$ Where: $Z = 1.96$ at 95% Confidence Level. $P =$ Expected prevalence (67.3 %). $D =$ Precision (margin of error) =0.05. Thus, the calculated sample size was 338 and to overcome the attrition; 20% were added to the calculated sample size to be finally 403 patients at least.

Sampling Technique: First: Proportionate random sample: According to the World Bank collection of development indicators, the rural population in Egypt was reported to be 56.67 % in 2017. Thus, the estimated sample size in the present study was retrieved according to this rural/urban distribution. Accordingly, 235 participants were recruited from rural health units and 168 from urban health centers. Aga Central Hospital was included to represent the urban setting as it is the only urban unit in the Aga district while rural health units were retrieved using a systematic random sample. Second: Systematic random sample: The sampling frame of the rural health units in Aga district include 36 rural family health units, and every 12th unit was included. From different geographical areas of Aga district, 3 rural health units were finally selected; named Shiwa (35 cases), Samaha (50 cases), and Sahrageh Elsoghra (150 cases) Health Units

Data was collected using a constructed three-part interviewer-administered questionnaire; Part I assessed the sociodemographic characteristics of diabetic patients. Part II assessed disease characteristics of studied patients as duration, treatment regimen, and complications, Part III

Table (1): association between Socio-demographic characteristics and satisfaction among diabetic patients.

	Total n=403	Poor to fair satisfaction n=242 (60.0%)	P-value	Odds ratio (95% CI)
Age in years				
32-42	20	15 (75.0)	0.01*	4.6 (.38-15.32)*
43-53	166	121 (72.9)	0.001*	4.12 (1.98-8.59)*
54-64	179	91 (50.8)	0.20	1.58 (0.77-3.23)
65-76 (r)	38	15 (39.5)		---
Gender				
Male (r)	215	116 (54.0)	0.008*	---
Female	188	126 (67.0)		1.7 (1.16-2.60)
Marital status				
Married (r)	366	218 (59.6)	0.530	---
Unmarried	37	24 (64.9)		1.25 (0.62-2.54)
Residence				
Rural (r)	168	76 (45.2)	p<0.001*	---
Urban	235	166 (70.6)		2.91 (1.93-4.40)
Education				
Secondary or less (r)	531	177 (33.3)	p<0.001*	---
More than secondary	114	65 (57.02)		2.65 (1.76-4.01)
Occupation				
Working	213	135 (63.4)	0.148	1.34 (0.90-2.0)
Not working (r)	190	107 (56.3)		---
Smoking status				
Smoker (r)	147	75 (51.0)	0.005*	---
Non-smoker	256	167 (65.2)		1.80 (1.19-2.72)
Income:				
Just enough	112	75 (67.0)	0.079	1.505 (0.95-2.37)
Not enough (r)	291	167 (57.4)		---
Health insurance:				
Yes	199	122 (61.3)	0.611	1.11 (0.74-1.65)
No (r)	204	120 (58.8)		---

*P-value was calculated using Chi-Square test *statistically significant r: reference group*

assessed patient satisfaction using a 26-items Satisfaction Diabetes Scale (26-SDS). This scale reflected the receipt of diabetes services and satisfaction. It is a validated reliable tool of 26 questions answered on a three-point Likert scale: dissatisfied =1, Fair =2, and satisfied =3. The cut-off point used for satisfaction was; poor (less than 50%), fair (50-70%), and good >70%.⁴

Validation of the tool: The Arabic version was pilot tested on A group of the target population (10 persons) from rural health units in the Aga district were tested to check the validity, clarity, comprehension, length, ease of running, and cultural acceptability in addition to improving the quality of the translated final version of the tool. It also helped in estimating the time

required for filling out the questionnaire and exploring the study site and the work system. After piloting, modifications were made. The estimated Cronbach's alpha of the tool was 0.77 which is scientifically accepted. The results of the pilot study were not included in the large-scale study

Data Analysis: The Statistical Package for the Social Sciences v.25 was used for data analysis after the coding and processing of data by the researcher. Categorical variables such as age, educational level, and residence are expressed as percentages and numbers, Chi-Square and Monte Carlo tests were used as appropriate according to the number of cells and expected count. Predictors of fair to poor satisfaction were detected using binary stepwise logistic

Table (2): association between diabetic characteristics and satisfaction among diabetic patients

	Total N=403	Poor to fair satisfaction n=242 (60.0%)	P-value	Odds ratio (95% CI)
Duration of DM in years:				
<3 years	141	95 (67.4)	0.028*	1.62 (1.05-2.48)
≥3 years (r)	262	147 (56.1)		---
Presence of family history				
Positive	217	141 (65.0)	0.029*	1.56 (1.05-2.33)
Negative (r)	186	101 (54.3)		---
Treatment regimen:				
Diet/Exercise	102	76 (74.5)	0.001*	6.63 (4.1-10.7)
Oral hypoglycemic	294	208 (70.7)	0.001*	22.55 (14.61-34.79)
Insulin	129	40 (31.0)	<0.001*	6.24 (3.94-9.88) *
Insulin & oral hypoglycemic	44	21 (47.7)	0.08	1.75 (0.935-3.29)
Presence of complications:				
Yes	257	189 (73.5)	<0.001*	4.88 (3.15-7.55)
No (r)	146	53 (36.3)		---
Diabetes control (according to last lab result):				
Yes	148	69 (46.6)	<0.001*	---
No	255	173 (67.8)		2.42 (1.59-3.66)

P-value was calculated using Chi-Square test *statistically significant *r*: reference group regression. *P* value was considered significant at level ≤ 0.05 .

RESULTS

The present study was carried out on 403 patients with a mean (SD) age of 54.17 (7.33) years ranging from 32-76 years, 53.3 % of them are males, 90.8% were married, 58.3% have urban residence, 52.9% are working, 63.5% are non-smokers and 72.2% states that their income is not enough. In addition, nearly half of our studied cases had health insurance. Approximately 63% of the patients were on oral hypoglycemic, 22% on insulin, and 11% on both. Of the studied patients; 40 % have good satisfaction, 50.9% have fair satisfaction and 9.2% only have poor satisfaction. A statistically significant association was found between patients' satisfaction and their age, sex, residence, education, and smoking history. Younger age was associated with a higher frequency of fair to poor satisfaction such as age 32-42, 43-53, and 54-64 (odds ratio 4.6, 4.12, and 1.58, respectively). Fair to poor satisfaction is 1.7 times more among females, 2.91 times more among patients with urban residence, 2.65 times more among secondary education or less, and 1.8 times more among non-smokers (Table 1 and Figure 1).

The median duration of diabetes among the studied cases was 3 years; ranging from 1-18 years, 53.8% of

the studied patients had positive family history, 73% of them were maintained on oral hypoglycemic drugs and unfortunately, 63.8% had complications as well as 63.3% had poor diabetic control. A statistically significant association was found between patients' satisfaction and positive family history, treatment regimen, presence of complications, and diabetic control. Sixty-seven percent of cases with diabetes duration less than 3 years have fair to poor satisfaction (Odds ratio=1.62) and 65% of cases with positive family history have fair to poor satisfaction with odds ratio (1.56). Among treatment regimens; oral hypoglycemic drugs have the highest risk of fair to poor satisfaction, followed by dietary restrictions (Odds ratio; 22.55 & 6.63, respectively). The presence of complications increased the risk of fair to poor satisfaction by 4.88 more times and cases with no diabetic control have the risk of fair to poor satisfaction by 2.42 more times than cases with good diabetic control (Table 2).

Multivariable analysis of significant factors in univariate analysis illustrates that; residence, treatment regimen, and complications were significant predictors of fair to poor satisfaction with the overall percent predicted being 72.2%. Odds ratios of significant factors were ordered as follows; 6.89 for

Table (3): Predictors of fair to poor satisfaction among studied patients

Predictors	β	p-value	Odds ratio (95% CI)
Age in years			
32-42	0.388	0.58	1.47 (0.373-5.83)
43-53	0.664	0.146	1.94 (0.793-4.75)
54-64	0.074	0.86	1.928 (0.402-2.145)
65-76 (r)			---
Gender			
Male (r)			----
Female	0.358	0.25	1.43 (0.778-2.63)
Residence			
Rural (r)			---
Urban	0.840	0.002*	1.54 (1.295-2.002)
Education			
Illiterate	.0.199	0.608	1.22(0.571-2.61)
Basic education	-0.61	0.051	0.544(0.295-1.002)
Secondary	.103	.780	1.109(0.537-2.289)
More than secondary (r)			---
Smoking status			
Smoker (r)			---
Non-smoker	0.273	0.382	1.52 (0.70-3.30)
Duration of DM in years:			
<3 years	0.568	0.072	1.76(0.95-3.27)
≥3 years (r)			---
Presence of family history	0.032	0.895	1.03(0.64-1.67)
Treatment regimen:			
Diet/Exercise	0.46	0.12	1.58 (0.89-2.81)
Oral hypoglycemic	1.162	<0.001*	2.79 (1.53-5.11)
Insulin	1.03	<0.001*	1.31 (1.172-3.567)
Presence of complications	1.93	<0.001*	6.89(2.87-16.55)
Diabetes control (according to last lab result)	0.419	0.290	1.52(0.70-3.30)

Overall % predicted = 72.2%, β : regression coefficient, CI: Confidence interval, r: reference group

the presence of complications, 2.79 for oral hypoglycemic drugs, 1.54 for urban residents, and 1.31 for insulin regimen (Table 3).

DISCUSSION

Many factors were found to affect diabetic patients' satisfaction such as patient-related factors, service-related factors, treatment adherence, and clinical factors, and highly depend on the setting.⁸ Regarding the distribution of the studied cases according to their satisfaction, the present study showed that 51.9% of the studied cases had fair satisfaction, 40% had good satisfaction and only 9.2% had poor satisfaction. A statistically significant association was found between patients' satisfaction and their age, sex, residence, education, and smoking history in our work; these were by Al Anazi et al., 2019. Younger age was associated with a higher frequency of fair to poor

satisfaction in the present study; this result was agreed with that of a study carried out in Tanta, Egypt,⁹ in which satisfaction level was higher among older age than younger age groups. In contrast, Bener et al., 2014 declared that young age was associated with more satisfaction than older ones.¹⁰ This may be explained by that elderly patients become aware of probable flaws in the care delivery system and have low expectations for the immediate circumstances, which will only provide satisfaction.

Our studied females were found to have a higher risk of 1.7 times fair to poor satisfaction than males; this is different from other previous studies conducted in Egypt,⁹ Saudi Arabia,⁸ and Kuwait;¹¹ these studies found that female patients had higher levels of satisfaction compared to male patients. Also, another study in Pakistan found that dissatisfaction among diabetic females was lower than among males.¹² This

could be clarified by that female patients are more vulnerable to poor satisfaction affected by their psychological status affected by illness behavior and might be due to societal gender roles that differ from one another.

Regarding residence, the present work showed urban settings had a higher risk of nearly 2.9 times fair to poor satisfaction than cases with rural residents; this is different from Mohammed *et al.*, 2019 who reported that most of the total participants in urban areas reported satisfactory interaction. This may be attributed to higher expectations of better health services provision by patients in rural residence. In addition, cases with secondary education and less in the current study were found to have a higher risk of fair to poor satisfaction than more than secondary education; this was also agreed with Eman *et al.*, 2018 study in which less educated patients were more satisfied than those with higher education (97.0% versus 90.9%) and Jalil *et al.*, 2017 study in which only 9.3% of non-educated patients revealed dissatisfaction with doctor-patient interaction in contrast to 15.8% of the educated counterpart.^{9,12} However, our result was different from that of other studies as Bener *et al.*, 2014 study in which highly educated patients and professionals expressed higher satisfaction scores compared to other patients.¹⁰ Our results may be explained by that the highly educated diabetics are more demanding, have higher expectations, and are more aware of their rights than the less educated patients who may be less demanding and less aware of high-quality health care available in their community.

Furthermore, the study showed that non-smokers had a higher risk of fair to poor satisfaction with diabetic services in comparison to the previous study which found no significant association between patient satisfaction and smoking status, whereas, most non-smoker patients expressed higher satisfaction levels.⁸ This can be explained by that non-smokers are more keen on their health than smokers.

The present study also found a statistically significant association between patients' satisfaction and positive family history, treatment regimen, presence of complications, and diabetic control. Unfortunately, fair to poor satisfaction was more prevalent among diabetic patients who had a disease duration of <3 years, positive family history, and treatment regimens with oral hypoglycemic followed by dietary

restrictions. Poor satisfaction was commonly reported also among patients with complications and diabetes uncontrol; it is obvious that higher levels of diabetic patients' satisfaction are associated with better outcomes.

A previous study found that there were significant associations between levels of patient satisfaction and their health status, mode of treatment, and diabetic control.⁸ This differs from studies in the United Arab Emirates revealed no significant relationship between diabetes control and patient satisfaction.¹³ Previous studies conducted by Alazri and Neal, 2003 found that uncontrolled diabetic patients were less satisfied.¹⁴ This may be explained by that cases with a positive family history are more anxious about possible complications of diabetes and need more intensive care and those with oral hypoglycemic drugs and insulin injections have more concerns about drug availability in health services.

CONCLUSION

Satisfaction of diabetic patients towards family health care services in the studied center was suboptimal. Lack of awareness of diabetic complications, urban residence, and cases of oral hypoglycemic drugs, and insulin treatment were independent contributors to the suboptimal satisfaction.

Ethical Consideration

This study was approved by the Institutional Research Board (IRB) at the Faculty of Medicine, Mansoura University with acceptance code "MS.19.01.456 ". Written consent was obtained from patients to participate voluntarily in the study with full right of withdrawal, with assurances of confidentiality and anonymity of the data.

Limitations of the study: A Cross-sectional study was carried out and if applied as a pre-post-health education study will be more indicative. Patient satisfaction is assessed by self-reported tool, and there may be underreporting or overreporting of behaviors or attitudes.

Recommendations: Improving patient education and more physician-patient interaction is probably required to improve satisfaction of diabetic patients. Awareness and continuous medical education programs to update family physicians about

adherence to clinical guidelines, complications of diabetes, and how to prevent these complications with regular revising of the educational materials. Providing family physicians with standardized algorithms (both hand-written and computerized) with the availability of drugs in each visit

Conflicts of Interest: The authors declare that they have no conflicts of interest.

Funding: None.

Acknowledgment: The authors would like to thank the patients who help with the data collection.

Availability of data and materials: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Cite this article as: Hend Magdy Mohamed Gomaa, et al. Satisfaction of Diabetic Patients Regarding Health Care Services Provided In Some Egyptian Family Health Care Units. *Egyptian Journal of Community Medicine*, 2023;41(3):186-192.

DOI: 10.21608/ejcm.2023.198946.1252