Quality of Care and Medication Adherence among Patients with Type (2) Diabetes Mellitus

Nagwa Nashat Hegazy MD[1]

[1]Family Medicine Department, Faculty of Medicine, Menoufia University

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Abstract

Background: Diabetes mellitus (DM) is a wide-reaching prevailing metabolic syndrome. Better medical adherence improves the diabetic glycemic control and postpones the diabetes-related complications. A good perceived quality of care could improve the adherence and correspondingly the wellbeing of the diabetic patients.

Objectives: were to assess treatment adherence in patients with type II diabetes, as well as the link between medication adherence and quality of care regarding the process and intermediate outcomes.

Methods: Patients with type 2 DM were recruited from Munshaat Sultan primary health center outpatient clinic, Egypt using a convenient sampling technique (150 participants).They were recruited over three months. All eligible participants were interviewed and their records were revised for the past year. The interviewing questionnaire contained three parts to sees the socioeconomic status, patient medication adherence, and quality of care perceived. **Results:** nearly half of the diabetic participants were low adherent resembling 55.3% of the studied group. Most of the low adherent patients were female, illiterate and those without medical insurance. The main quality of care hindrances they pointed at were long waiting time and short consultation period. A statistical positive correlation was found between the adherence score and quality of care score and process of care score simultaneously.

Conclusion: this study showed that nonadherence of the diabetic patients is a prevailing problem.

Keywords: Diabetes, adherence, general practice, family medicine, facility services

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Introduction: Diabetes mellitus (DM) is a wide-reaching prevailing metabolic syndrome. The World Health Organization (WHO) had anticipated that DM is going to become the seventh most significant primary cause of death worldwide by the year 2030.[1] It is the 11th most significant reason for premature mortality in Egypt. It is blamable for nearly two percent of all years of life lost (YLL). Correspondingly, it is the 6th chief reason of disability burden in Egypt. Thus the improvement of patient medication adherence will assist to decline these figures.

Adherence conceptually includes numerous types of health-related behavior and isn't just around taking prescribed medication. It is defined as "the extent to which the patient follows medical instructions".[2] It had been reported that good medical adherence leads to better diabetic glycemic control and postponing of diabetes-related complications.[3]

Quality of care (QoC) had been defined by the WHO as 'the degree to which the health care amenities are provided to healthy and ill populations improve the

anticipated health outcomes. Thus health care needs to be safe, efficient, timely, effective, equitable, and people-centered'[4]. Most of the health care quality improvement efforts object the measures of health care in the terms of structures, processes, and/or outcomes [5.] Two main chief dimensions of QoC for individual patients have been defined; access and effectiveness. Effectiveness is constituted of two main fundamentals termed clinical care effectiveness and inter-personal care effectiveness. These components could be discussed in the terms of the structure of the health care system, processes of care, and outcomes resulting from care [6]. Quality of care and adherence to medication are interrelated in the literature on diabetes. Theoretically, it is supposed that better quality of care will improve the medication adherence. However, the studies didn't examine that link. To the best of our knowledge, there was sacristy of conducted research on adherence and QoC in Egyptian diabetic patients. Therefore it seemed important to investigate the relation between these two parameters. The objectives of the current study aimed to assess medication adherence among patients with type 2 diabetes mellitus, as well as the link between medication adherence and domains of quality of care.

Methods:

The protocol of the study was approved by the Ethical Committee of the Faculty of Medicine, Menoufia University. An informed written patient consent was attained from each participant after explaining the research objectives. The study was a descriptive cross-sectional study performed in Munshaat Sultan primary health care center (PHC) which is an accredited PHC by the Egyptian Ministry of health and population (MOHP). The inclusion criteria for participants were having noncomplicated type 2 diabetes for over 2 years (diagnosed based on the American Diabetes Association criteria)[7] taking oral hypoglycemic drugs (OHDs) once per day.

The sample size was calculated using EPI calculation program based on the prevalence of diabetic patients in Egypt which was 15.56% [8] and the population of Munshaat sultan which was 25,239 at 2016.According to the equation, the sample size was 128 patients and it was raised to 150 patients to overcome drop out. All the registered type 2 DM patients attending the PHC from 10:00 am to 2: 00 pm daily for 5 days during the period of study were invited to participate in the study. Data collection took place from March to June 2017.

All participants were interviewed and their medical records were revised. Data was collected via a questionnaire consisting of three scales. The first part had included questions on socio-demographic characteristics. Furthermore, the socioeconomic status (SES) was evaluated based on Fahmy et al., socioeconomic scoring system.[9] The second part was to evaluate patient adherence as an intermediate outcome of effectiveness through an Arabic validated Morisky adherence scale.[10] It is an eight-item questionnaire with scores ranged from zero to eight. Score less than six is considered non-adherent while score more than six was considered adherent. The third part was designed to measure the QoC based on Mosadeghrad framework.[11]
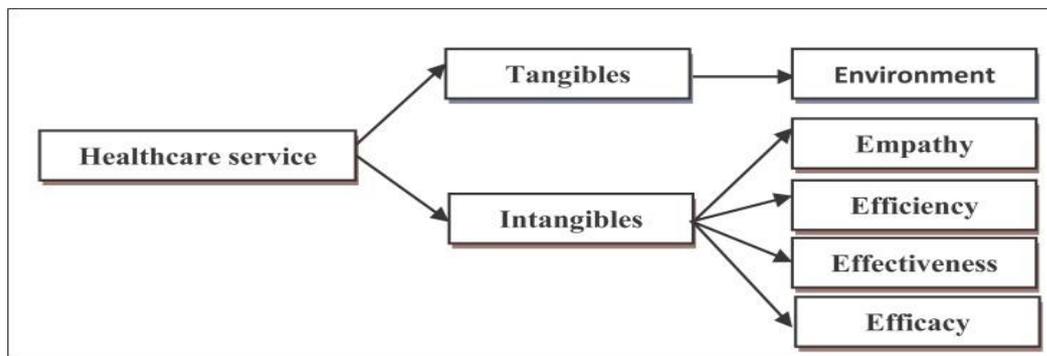

Figure (1): A conceptual framework for quality measurement in healthcare

It entailed two parts; the first part was to assess environmental and empathy domains through nine questions with 3 point –likert scale (agree, neutral, disagree). Then a score was calculated to assess the QoC received by the patient where a score of less than 60% was considered poor QoC. The second part was to assess the effectiveness and efficacy domain through using a checklist to evaluate the diabetic process of care. According to the recommendations of national guideline of MOHP,[12] the process measures that could be considered as representative of quality of diabetes care ten basic items: blood pressure, blood glucose, proteinuria, peripheral pulses, peripheral sensations, foot examination, referral for doing an ophthalmic examination, assessment of urea, assessment of electrolytes, and assessment of glycosylated hemoglobin. Scoring system to assess the extent of fulfillment of ten items according to the national guideline in the past year was used where a point was considered on doing each item gains a point. The process of diabetic care was considered as, good by achieving 6-10 points and considered poor on achieving less than 6 points.

Statistical analysis:

Data were collected, tabulated, statistically analyzed using an IBM personal computer with Statistical Package for Social Science (SPSS) version 20 where the following statistics were applied.

a- Descriptive statistics: in which quantitative data were presented in the form of a mean (), standard deviation (SD), range, and qualitative data were presented in the form numbers and percentages. b- Analytical statistics: used to find out the possible association between studied factors and the targeted disease. The used tests of significance included: 1-Student t-test: is a test of significance used for comparison between two groups having quantitative variables. 2- Pearson correlation (r): is a test used to measure the association between two quantitative variables. A probability value (P-value) less than 0.05 was considered statistically significant and was high statistically signification if $P < 0.01$)

Results:

Most of the studied population were females (69.3%), married (79.3%), with basic primary education (65.3%) and working (62%). Half of the studied group were in the low socioeconomic status 51.3% (Table 1). Nearly half of the diabetic patients who had participated in the study were low adherent resembling 55.3% of the studied group (Figure 2). There was a statistically significant difference in the low adherence regarding sex, occupation, health insurance, and disease duration. Low adherence participants were mainly female (P < 0.001), not working (P < 0.001), without health insurance (P < 0.001) and with lower disease duration (P =0.002) (Table2).

Nearly 78% of the participants couldn't spend enough time with their doctors. Half of the participants had difficulties to conduct the necessary tests and to access to center (The center is far from the place of residence of one hundred patients).Almost 60.7 % complained from the Long waiting time (Table 3). Nearly 70 % of the participants had expressed obstacles during their visit to the healthcare facility (Figure 3). Nearly all the participants underwent weight and blood pressure measurement (Table 4). There was a statistically significant correlation between adherence score and QoC score (P= 0.04) (figure 4). Also, there was a statistically significant correlation between adherence score and process of care score (P<0.001) (figure5).

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Discussion:

Nearly half of the participants had shown low adherence to oral hypoglycemic medications which is in agreement with Donnan et al., [13]. Good adherence (Morisky score ≥ 6) was linked with female sex and older age. Kirkman et al, had found that adherence was independently related to older age and male sex.[14] The sex difference could be explained by the fact that the majority of the studied population in the current study were females. Presence of the environmental factors in the health care system was prevailing among the participants where 78% didn't spend enough time with the physician and 66.7% had expressed that the center is far from their residence which is in agreement with Mosadeghrad and Ali.[15]

There was a statistically significant positive correlation between patient-perceived experiences on environmental factors and the clinical outcomes in the form of adherence with is in agreement with Price et al., who found the positive relation between patients' use of services and health outcomes.[16] There was a statistically significant correlation between adherence score and process of care score which is in agreement with Karapek et al, who found good HbA1C scores with high Morisky adherence scores [17]. He stated that The Morisky score may be an effective tool for detecting patients with poor medication-taking behavior.

Conclusion:

Non-adherence of the diabetic patients is a vital problem. Primary health care services and quality of care provided is a keystone in shaping their adherence thus improving the healthcare service quality and the processes of care will improve patient adherence and reduce the frequency and severity of diabetic complication. Findings of the current study could be extrapolated to a large population.

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Table (1): Socio demographic data of studied group (N=150):

Socio demographic characteristics	No	%
Age/years: $(\overline{X} \pm SD)$ Range	44.9±4.1 32-50	

Gender:
  ▪ Female
  ▪ Male
	
	104
	46
		
		69.3
		30.7

Marital state:
  ▪ Single
  ▪ Married
  ▪ Widow
  ▪ Divorce
	
	2
	119
	17
	12
		
		1.3
		79.3
		11.3
		8

Educational level:
  ▪ Illiterate
  ▪ Basic
  ▪ Secondary
  ▪ University and above
	
	2
	98
	39
	11
		
		103
		65.3
		26
		7.3

Occupation:
  ▪ Not work
  ▪ Worker
  ▪ Technician
  ▪ Government employee
	
	93
	7
	26
	24
		
		62
		4.7
		17.3
		16

Socioeconomic level:
  ▪ High
  ▪ Moderate
  ▪ Low
	
	31
	77
	42
		
		20.7
		51.3
		28

Heath insurance:
  ▪ Yes
  ▪ No
	
	23
	127
		
		15.3
		84.7

Disease duration: $(\overline{X} \pm SD)p$ Range	7.71±4.8 1-26	

Table (2): Relationship between patient adherence to medication and socio-demographic characteristics   (N=150):

Socio demographic characteristics	Adherence				χ^2	p value
	Low (n=83)		Moderate (n=67)			
	No.	%	No.	%		
Gender:					19.9	<0.001
▪ Male	38	45.8	8	11.9		
▪ Female	45	54.2	59	88.1		
Marital state:					1.87	0.59
▪ Single	1	1.2	1	1.5		
▪ Married	69	83.1	50	74.6		
▪ Widow	6	7.2	6	9		
▪ Divorce	7	8.4	10	14.9		
Educational level:					2.28	0.52
▪ Illiterate	1	1.2	1	1.5		
▪ Primary education	50	60.2	48	71.6		
▪ Secondary or diploma	25	30.1	14	20.9		
▪ University and above	7	8.4	4	6		
Occupation:					13.4	<0.001
▪ Not work	41	49.4	52	77.6		
▪ Worker	4	4.8	3	4.5		
▪ Technician	20	24.1	6	9		
▪ Government employee	18	21.7	6	9		
Socioeconomic level:					3.9	
▪ High	22	26.5	9	13.4		
▪ Moderate	21	25.3	21	31.3		0.14
▪ Low	40	48.2	37	54.8		
Heath insurance:					5.77	
▪ Yes	18	21.7	5	7.5		
▪ No	65	78.3	62	92.5		0.02
Age / years $\bar{X}\pm SD$	44.2±3.9		45.2±4.2		t=1.5	0.13
Disease duration $\bar{X}\pm SD$	6.53±4.44		8.66±5.0		t=2.7	<0.001

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Table (3): Environmental Quality of care received by the patient (N=150):

Obstacles	No	%
The time you spend with your doctor is not enough:		
▪ Disagree	32	21.3
▪ Neutral	1	0.7
▪ Agree	117	78
Difficult to conduct the necessary tests:		
▪ Disagree	70	46.7
▪ Neutral	0	0
▪ Agree	80	53.3
Difficulty of access to the center:		
▪ Disagree.	64	42.7
▪ Neutral.	0	0
▪ Agree.	86	57.3
The center is far from the place of residence:		
▪ Disagree.	47	31.3
▪ Neutral.	3	2
▪ Agree.	100	66.7
High cost of the services:		
▪ Disagree.	64	42.7
▪ Neutral.	0	0
▪ Agree.	86	57.3
Non-existence of a doctor		
▪ Disagree	106	70.7
▪ Neutral	0	0
▪ Agree	44	29.3
Appointments within the center is not appropriate		
▪ Disagree	63	42
▪ Neutral	0	0
▪ Agree.	87	58
Long wait time		
▪ Disagree	59	39.3
▪ Neutral	0	0
▪ Agree	91	60.7
The physician showed empathy and understanding of the condition:	100	66
▪ Disagree	1	0.7
▪ Neutral	49	32.7
▪ Agree		

Table (4): Assessment of process of care recorded in Diabetic patients files in the past year.

Process of care	No	%
Blood pressure(check BP at each visit) ▪ Yes ▪ No	150 0	100 0
Weight:(at each visit) ▪ Yes ▪ No	150 0	100 0
Blood glucose:(at each visit) ▪ Yes ▪ No	111 39	73.8 26.2
Test for proteinuria(annual) ▪ Yes ▪ No	68 82	45.3 54.7
Peripheral sensation (at each visit) ▪ Yes ▪ No	130 20	86.7 13.3
Peripheral pulse:(at each visit) ▪ Yes ▪ No	112 38	74.7 25.3
Foot examination:(at each visit) ▪ Yes ▪ No	130 20	86.7 13.3
Ophthalmic examination:(annual) ▪ Yes ▪ No	99 51	66 34
Urea and electrolytes:(annual) ▪ Yes ▪ No	6 144	4 96
Glycosylated hemoglobin(HA1c) * Yes No	16 134	10.7 89.3

* Test HA1c every 6 months if controlled; Every three months if not controlled or if change in therapy.
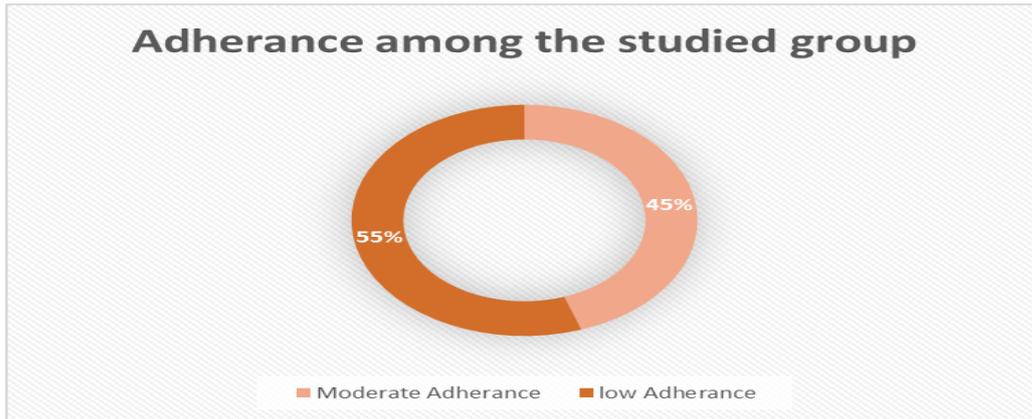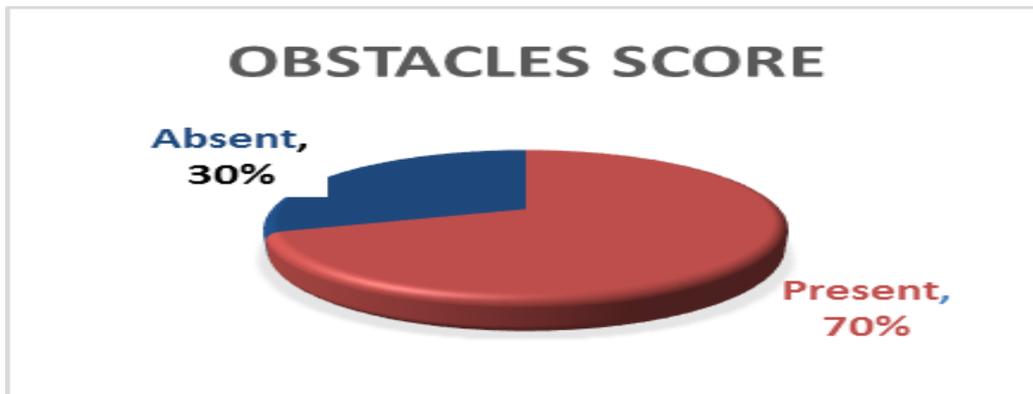
Figure (2) Adherence among the studied groups

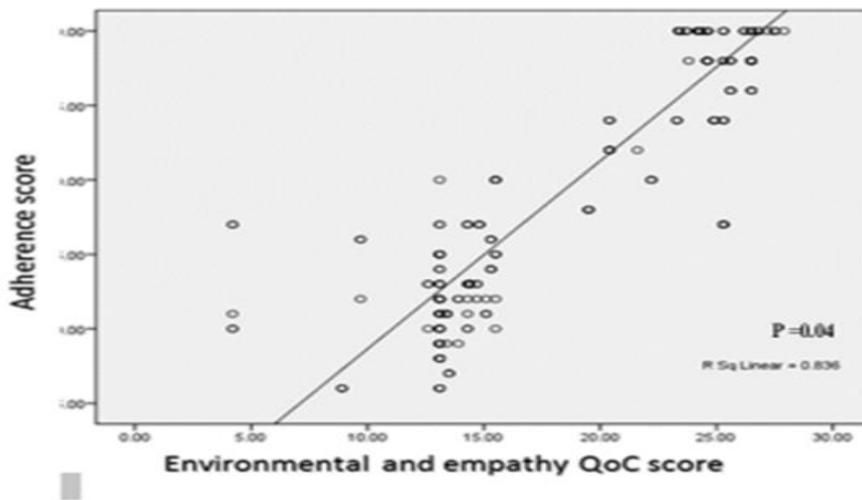**Fig (3): Distribution of study group according to presence of obstacles of care**

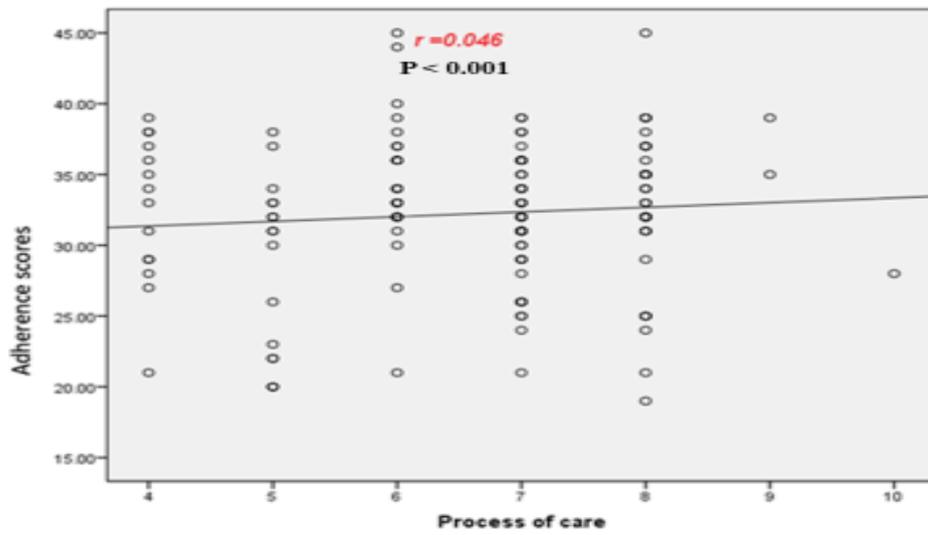**Figure (4): Correlation between medication adherence score and QoC**

Figure (5): Correlation between medication adherence score and process of care

جودة الرعاية الصحية والالتزام الدوائي لدي مرضى البوال السكري(النوع الثاني)

نجوى نشأت حجازي

قسم طب الأسرة- كلية الطب- جامعة المنوفية

الخلفية: ان مرض السكري هو متلازمة الأيض السائدة في جميع انحاء العالم، مما لا شك فيه أن تحسين الرعاية الطبية ستؤدي الى تحسين نسبة السكري بالدم مما سيقلل المضاعفات ذات الصلة لمرض السكري،وبالتالي فان تحسين الرعاية سيؤدي الى تحسين الالتزام الدوائي مما سيحسن من الحالة العامة لمرضي السكري.

الأهداف: تقييم مدى الالتزام الدوائي لدي المرضي المصابين بمرض السكري من النوع الثاني ، وكذلك الصلة بين الالتزام الدوائي وجودة الرعاية الصحية المتلقاة فيما يتعلق بالعملية والنتائج الوسيطة. **المنهجية و طرق البحث:** تم حشد المرضي من النوع الثاني لمرض السكري من عيادة منشأة سلطان للامراض الخارجية بمركز طب الأسرة وذلك باستخدام العينة المحسوبة مما أسفر عن تجميع 150 مشارك، وقد جمعهم علي مدي ثلاثه أشهر وتم اجراء المقابلات مع جميع المشاركين المؤهلين ونقحت سجلاتهم الطبية للعام الماضي وتم مراجعتها . وتضمنت المقابلات استبيان يتكون من ثلاثه أجزاء هي الرؤية للوضع الاجتماعي ولاقتصادي ، والالتزام الدوائي بعلاج المرضي ، وجودة الرعاية الصحية المتلقاة. **النتائج:** وقد اظهرت النتائج ان ما يقارب نصف المشاركين لديهم عدم التزام دوائي بنسبة 55.3 ٪ من المجموعة المدروسة. وكان معظم المرضي المنتميين إلى الرعاية المنخفضة من الإناث والأميين وممن لا يحملون التامين الطبي. وكانت النوعية الرئيسية لعوائق الرعاية التي أشاروا اليها هي فتره الانتظار الطويلة ومده المشورة القصيرة. وتم العثور علي ارتباط إحصائي إيجابي بين نقاط الانضمام ونوعيه نقاط الرعاية وعمليه الرعاية في وقت واحد. **الاستنتاج:** وخلصت هذه الدراسة ان الالتزام الدوائي لدي مرضى ا السكري(النوع الثاني) تعتبرمشكله سائده ولها علاقة بجودة الرعاية الصحية المقدمة للمريض.