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Diabetes Mellitus Health Care Provision Audit at Primary Health Care Facilities in Dubai

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Abstract

Background: Quality indicator is a measurable element of practice performance for which there is evidence that it can be used to assess the quality and hence change the quality of care provided. *Objectives:* To study Care provision (process and outcome indicators) to patients with diabetes at primary care facility in Dubai. *Methodology:* Cross sectional study was conducted in primary health care centers DHA Dubai. Dubai are divided into two regions: deira and Bur Dubai. All adult (18 years and above) diabetic patients attending PHC centers, with available record, both males and females were selected. Patient should be diagnosed with diabetes mellitus for at least one year. Patient should have at least two visits to the study clinic in the 24 month at the start of the study. Gestational diabetes were excluded. By using EPI- INFO version 6.04 program the minimal sample size required is calculated to be 362. Multi stage stratified random sampling method was used. A structured questionnaire was used for data collection. *Results:* The quality indicators of care provided to diabetic patients. As regards the process of care, the blood pressure was measured in every visit in all cases, the LDL was measured in the last 12 months in 98.9%, 93.5% had foot examination in the last 12 months, 83.5% had eye examination in the last 12 months and only 60.7% had their Hba1c measured every 3 months. For the outcome of care indicators, it can be noted that 60.2% had their blood pressure at target controlled as compared to 53.1% for LDL and only 44.1% for HbA1c. *Conclusions:* Auditing process and outcome of care which have been delivered revealed a reasonable adherence to the guideline, the process of care showed better adherence than the outcome of care as the process were more related to the system where the health care delivered while the outcome of care is multi-factorial product. *Recommendations:* Filling the gap shown by this study in the diabetic care system at PHC/ Dubai health authority, through proper address of the weakness in the domain of continuity of care which showed low diabetes control.

Keywords

Audit, Diabetes Mellitus, Care Provision, Dubai

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1. Introduction

Diabetes mellitus (DM) is a metabolic disorder resulting from a defect in insulin secretion, insulin action, or both. Insulin deficiency in turn leads to chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism[1-4]As the disease progresses tissue or vascular damage ensues leading to severe diabetic complications such as retinopathy[5],neuropathy[6],nephropathy[7]cardiovascular complications[8] and ulceration[9] Thus, diabetes covers a wide range of heterogeneous diseases. Diabetes is serious and costly public health problem that's increasing in alarming

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rate[10]. DM has become one of the most important public health challenges for the 21st century. Over 150 million adults are affected by DM worldwide, and this number is expected to double in the next 25 years[11,12]. The rate of increase in diabetes incidence will be dramatically higher in developing countries: between 1995 and 2025, the number of individuals with diabetes is expected to increase by 170% in the developing world, compared with 42% in developed nations[12]. Diabetes represents a real challenge to the health planners in UAE due to its high prevalence and increased economic cost to society [13].

A prevalence survey, performed in 1989–90 on adults in the UAE, and two nearby rural communities in which diagnosis was made using a single fasting glucometer reading of >11.1 mmol/liter, found an overall prevalence of diabetes mellitus of 6%[14]. A more recent survey suggests a much higher prevalence of over 20% of the urban adult population over 30 years of age in Al Ain, UAE [15]. Quality of care to diabetic patients can be assessed through several of ways: First: satisfaction is the patient's judgment of quality of care. Patient satisfaction is defined as "an evaluation based on the fulfillment of expectations". Evaluation of patient satisfaction has become a standard part of evaluation of a health care system, and meeting patient expectations has become one of the main objectives of health care providers[16].

The importance of meeting the expectations of the population by health care providers is widely accepted as one of the indicators of a functioning system[17]. It is becoming increasingly recognised that patient's views should be taken into account as a part of comprehensive assessment of quality of care[18]. Satisfied patients are more likely than dissatisfied ones to continue using health care services, maintain their relationships with specific health care providers and comply with care regimens[17]. Patient satisfaction can be utilised for three main purposes, first: as an evaluation of quality of care, second: as an outcome variable in its own right and third: as an indicator of weaknesses in service that is in a process of change[19]. Second: auditing of quality indicators It is well known that one way of assessing the quality of care is through the use of quality indicators; quality indicator is a measurable element of practice performance for which there is evidence that it can be used to assess the quality and hence change the quality of care provided[20].

A number of international federation and association developed and recommended standards and guidelines for diabetes care and managements. The American diabetic association has suggested guidelines for diagnosis, classification and screening of diabetic patients. Even though the ADA guidelines for desired HbA1C values, lipid and Bp value have been widely distributed in the primary care setting where most diabetic patient managed[21,22]. Diabetes mellitus is high prevalent chronic (non communicable) disease in the United Arab Emirate as with a prevalence of approximately 24%. Proper management of diabetes mellitus can reduce, delay the complication of diabetes and even prevent them to some degree. It is well known that the primary health care centers is the corner stone place for good management of diabetes mellitus Quality of care is an increasingly important concept, with governments and other funding health care services wanting the best return for their investment Thus assessing the quality of care important to know the existing situation and to detect the points needed for improvement.

2. Objectives

To study Care provision (process and outcome indicators) to patients with diabetes at primary care facility in Dubai.

3. Methodology

Cross sectional study was conducted in primary health care centers DHA Dubai. Dubai are divided into two regions: deira and Bur Dubai. All adult (18 years and above) diabetic patients attending PHC centers, with available record, both males and females were selected. Patient should be diagnosed with diabetes mellitus for at least one year. Patient should have at least two visits to the study clinic in the 24 month at the start of the study. Gestational diabetes were excluded. By using EPI- INFO version 6.04 program the minimal sample size required is calculated to be 362. Multi stage stratified random sampling method was used. Three centers was selected from each region randomly, with equal allocation of the sample in the chosen centers. The total number of sample (362) was divided into the six centers so around 60 patients from each center was chosen. All patients attending the clinic was chosen until the completion of the required sample size. A structured questionnaire was used for data collection; data was collected through face to face interview. Makhdoom and coworkers questionnaire[23] was used in this study. It covers the standard domains used in North American and European survey by other authors including Donabedian.

4. Results

Table (1) shows the personal data of the diabetic patients attending primary health care centers. It can be noted that more than half the cases aged between 45 – 65 years or age with a mean of 52.18 + 11.50 years, 63.9% were females and 85.4% were from local nationality. As regards the marital status 81.1% were married, 5.2% single and the rest were divorced and widowed (5.6%, 8.1% respectively). As for

education the sample was nearly with equal distribution between school grades with the least in University (21.5%) and the highest percentage in Primary (30.0%). Most of the sample members were not working (67.2%).

Table 1. Socio-demographic distribution of diabetic patients Attending PHC Centers.

Personal data		No.	%
Age (Years)	18-44	128	23.7
	45-54	175	32.4
	55-64	172	31.9
	65-74	46	8.5
	75+	19	3.5
Mean (SD)	52.18 (11.50)		
Sex	Male	195	36.1
	Female	345	63.9
Nationality	Local	461	85.4
	Non local	79	14.6
Marital status	Single	28	5.2
	Married	438	81.1
	Divorced	30	5.6
	Widowed	44	8.1
Education	Illiterate	128	23.7
	Primary	162	30.0
	Secondary	134	24.8
	University	116	21.5
Occupation status	Working	177	32.8
	Not Working	363	67.2

Number of patients = 540

Table 2. Diabetes related data and its complications in diabetic patients attending PHC Centers DHA 2010.

Variable		No.	%
Diabetes related data			
Duration of diabetes	<=5	241	44.6
	>5	299	55.4
Regimen for treatment	Diet/Exercise	19	3.5
	Oral hypoglycemic	441	81.7
	Insulin	4	.7
	Oral hypoglycemic + Insulin	76	14.1
Complication of diabetes			
Retinopathy	Yes	38	7.0
	No	502	93.0
Neuropathy	Yes	94	17.4
	No	446	82.6
Nephropathy	Yes	14	2.6
	No	526	97.4
Coronary artery diseases	Yes	41	7.6
	No	499	92.4
Vascular diseases	Yes	20	3.7
	No	520	96.3
Occurrence of stroke	Yes	2	.4
	No	538	99.6
Hypertension	Yes	315	58.3
	No	225	41.7

Number of patients = 540

Studying the diabetes related data, Table (2) shows that the duration of diabetes was more than 5 years in 55.4% of the cases as compared to 44.6% having diabetes for 1-5 years, more than three quarters of the cases used oral hypoglycemics (81.7%), 3.5 % used only diet and exercise, only 0.7% used insulin and the rest (14.1%) used combined insulin and oral hypoglycemics. As regards the diabetes complications, it was recorded among the cases as follows: Retinopathy in 7%, Neuropathy in 17.4%, Nephropathy in 2.6%, Coronary artery disease in 7.6%, Vascular diseases in 3.7%, Stroke in 0.4% and hypertension in the vast majority 58.3%

Table 3. Quality indicators of care provided to diabetic patients Attending Primary Health Care Centers at Dubai Health Authority 2010.

	Done		Not done	
	No.	%	No.	%
Process of care indicators				
Blood pressure measured every visit	540	100.0	-	0.0
Hemoglobin a1c(hba1c) measured every 3 months	328	60.7	212	39.3
Low density lipoprotein measured in the last 12 months	534	98.9	6	1.1
Foot examination in the last 12 months	505	93.5	35	6.5
Eye examination in the last 12 months	451	83.5	89	16.5
Outcomes of care indicators				
HbA1c at target controlled	238	44.1	302	55.9
LDL at target controlled	287	53.1	253	46.9
Blood pressure at target controlled	325	60.2	215	39.8

Number of patients = 540

Table (3) shows the quality indicators of care provided to diabetic patients. As regards the process of care, the blood pressure was measured in every visit in all cases, the LDL was measured in the last 12 months in 98.9%, 93.5% had foot examination in the last 12 months, 83.5% had eye examination in the last 12 months and only 60.7% had their Hba1c measured every 3 months. For the outcome of care indicators, it can be noted that 60.2% had their blood pressure at target controlled as compared to 53.1% for LDL and only 44.1% for HbA1c.

Table (4) revealed the association between the process and outcome of care measures and satisfaction. As regards the outcome of care the LDL and the blood pressure kept at target controlled, showed association with overall satisfaction and this was statistically significant ($Z = 2.32$, $P = 0.021$, $Z = 2.20$, $P = 0.028$ respectively).

Table 4. Audit indicators of diabetic patients Attending Primary Health Care Centers at Dubai Health Authority 2010.

		Overall satisfaction			Z	P
		No.	$\bar{X}$	SD		
Process of care indicators						
Blood pressure measured every visit	Done	540	90.31	2.38	-	-
	Not done	-				
Hemoglobin a1c(hba1c) measured every 3 months	Done	328	90.27	2.28	0.93	0.353
	Not done	212	90.36	2.54		
Low density lipoprotein measured in the last 12 months	Done	534	90.31	2.39	0.36	0.722
	Not done	6	90.26	1.21		
Foot examination in the last 12 months	Done	505	90.33	2.38	0.77	0.442
	Not done	35	90.04	2.41		
Eye examination in the last 12 months	Done	451	90.32	2.41	0.44	0.663
	Not done	89	90.26	2.26		
Outcomes of care indicators						
HbA1c at target controlled	Done	238	90.42	2.35	0.84	0.399
	Not done	302	90.22	2.41		
LDL at target controlled	Done	287	90.50	2.37	2.32	0.021*
	Not done	253	90.09	2.38		
Blood pressure at target controlled	Done	325	90.13	2.37	2.20	0.028*
	Not done	215	90.57	2.39		

Z = Mann-Whitney Test
* $P < 0.05$ (Significant)

5. Discussion

The primary health care setting is essential in delivering health care services. It is well known that identification of patient requests, needs and judgment on health care received is the starting point of patients centered approach evaluate the quality of health services and can predict both compliance and utilization that associated with the continuity of care. (24) this study provided information regarding the quality of care among adult diabetic patients who were attending the primary health care centers in Dubai Health Authority. This was done through assessing performance indicators regarding the auditing the files of patients to check if the process and outcome of delivered cares complying with the adopted (ADA) standard of care or not.

The total sample size was 540 participants. With chronicity of diabetes and the frequency of visiting the heath care providing settings, patient becomes more accustomed with the already existent services. opposite to other studies which found no significant association between indicator outcomes and the duration of the disease such as Wredling et al., (2000) (25), Hirschl et al., (2000) (26) and Redekop et al., (2002). (27) The present study found no significant association between regimen of treatment and all domain of quality except for provision of health education which showed that patient who was taking combined oral hypoglycemic treatment and insulin were more controlled than other two category (oral hypoglycemic drugs alone or diet/exercise) ($p = 0.05$), although this finding was statistically significant, no justification could be found. The current result was contradicting with other studies that showed patients being treated with insulin were less controlled than those using oral hypoglycemic drug Nicolucci et al., (2009) (28) and Bidrman et al., (2009). (29)

Although chronic medical conditions are associated with worse health status, the degree to which a particular illness relates to an individual patient's satisfaction with health care may vary according to the nature and severity of the condition (30). The current study reflected higher control rate with the provided health services among diabetic patients with complications compared with patients who didn't suffer from such complications. Moreover the more the complications, the more the less control among patients.. The results of current study were similar with other studies that showed the least controle among diabetic patients with complication Ken et al., (2002) (31), Greenfied et al., (2002) (32) and Nicoluci et al., (2009) (28). While other studies found no association between complication and outcome such as Hirsch (2000) (26), Redekop et al., (2002) (27), kerr et al (2003) (33),Gross et al., (2003) (34) and Fan et al., (2005). (35)

The retrospective study of the records of adult diabetic patients is reflecting how strict both process and outcome of care management indicators for diabetic patients in primary health care setting in Dubai were followed. Blood pressure was documented in all diabetic patients on each visit (100%) this can be explained as it is a routine procedure that's done and documented by the practicing nurses. Furthermore, this result reflect the strict rules and regulations that have been implemented by DHA as a part of continuous quality improvement program for diabetes care in family practice

setting.Assessment of glycosylated hemoglobin levels is an objective measure of metabolic control of diabetes. This study showed that, 60.7% of the patients had HbA1c performed four times/year which was lower than the figure detected in USA (97.4%) (36), HbA1c was performed once a year in other study.

The international guidelines necessitate that, HbA1c should done twice/year for controlled patients and 4 times/year for uncontrolled patients. Concerning LDL measuring for diabetic patients, our findings revealed a high performance rate (98.9%) in comparison with 75% in Bosnia (37) and 87.6% in USA (36). Funduscopy referral in our study was high (83.5%) as compared to other studies where it was 66% in USA (38) Feet examination was performed in approximately 93% of the patient which was high compared with other studies in Bosnia, (53.4%) (37) and in England (70.4%). (39)The implementation of treatment goals for diabetes is challenging, however, it has been suboptimal in most clinical settings (40). However our study showed the following: Regarding the intermediate outcome of care measures; the study showed that the proportion of patients with good glycaemic control (HbA1c < 7%, according to the ADA guidelines) were 44.1% which was nearly the same compared to a study done in USA (44%) (41), while a higher percent was reported in Australia (57%). (42)

Hypercholesterolemia is major treatable cardiovascular risk factor in diabetic patients. The current study revealed that 53.1% of the diabetic patients reached the ADA target of controlling LDL (LDL < 100 mg/dL), this finding is in agreement with other studies done in USA (36) and Australia (42) which reported percentages of 46.1% and 52.8 % respectively. The present study showed that the proportion of patients achieving the target of ADA for controlling the blood pressure (<130/80mmHg) were 60.2% as compared to 33% in another study(38).There are multiple barriers to reach BP goals in primary care including, patient factors (social, economic, physiological, and treatment-related factors), provider factors (clinical inertia, polypharmacy, and time constraints), and system factors (insurance coverage, medication co-payments, access to primary care, self-managementprograms, and reimbursement schemes). Additionally, the recommended changes to diet and lifestyle are challenging for patients, and the lack of knowledge about health outcomes from poorly controlled hypertension can be a barrier to achieve the recommended goal. (43). These better outcomes include better compliance, and adherence to medical regimes.(44) However, it is equally true that people who receive both good process and good outcome of care are likely to be more controlled.(45) The current study result showed no significant association or relation between the control of diabetes (HbA1c<7) and quality of care, while control of LDL (LDL<100) was associated with increased Controlling of blood pressure (BP<130/80) was associated with decreased quality of care. Other studies which had been conducted in this field showed that there is an association between quality of care and the outcome of care determined by HbA1c, where increased patient satisfaction usually lead to an improvement in the outcome of diabetes in term of HbA1c and vise versa. Alazri et al., (2003) (46) and Redekop et al., (2002) (27) found that poorly controlled diabetic patients were being less served.

6. Conclusions

Auditing process and outcome of care which have been delivered revealed a reasonable adherence to the guideline, the process of care showed better adherence than the outcome of care as the process were more related to the system where the health care delivered while the outcome of care is multi-factorial product.

Recommendations

Filling the gap shown by this study in the diabetic care system at PHC/ Dubai health authority, through proper address of the weakness in the domain of continuity of care which showed low diabetes control.

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