

# Audit of diabetic care in family practice center in Abha City, Aseer region: CBAHI standards application

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## ABSTRACT

**Objective:** The objectives of this study is to assess the quality of diabetic care at AlManhal PHCC based on CBAHI standards. **Methods:** This audit was conducted during 2018 at Al\_Manhal PHCC through assessment all aspects of DM care ( structures, processes and outcomes) using CBAHI standards . Data entry and analysis were managed used SPSS. **Results:** Most of DM structures were available at the PHCC , however, health educational program , lab relevant facilities were partially met the standards. Records of 429 patients were assessed for process of care which were satisfactory except for laboratory investigations and eye examination which were partially met . Good DM metabolic control was (28%) , HTN control (71%) and lipid control( 54%), good compliance with appointment was 85% . The most common documented complications were retinopathy( 14%), nephropathy (4.5%) and CHD( 4%). **Conclusion and Recommendations:** This audit revealed that using of CBAHI standards for DM care at PHCC is simple and practical and could help to identify the weak areas that needs improvement. The present care of DM in our PHCC has acceptable infrastructures except for health education program , laboratory and referral system which should be scaled up to improve the processes and outcomes. DM control is still a big challenge and needs more collaborative effort between health care providers and patients.

**Keywords:** Aseer Region, CBAHI, Diabetes care, Family Practice, Quality, Saudi Arabia

## Introduction

Diabetes Mellitus is growing dramatically worldwide during the last few decades. Its prevalence during 2019 was estimated to be about 9.3%, while by 2030, the total number of diabetics will exceed 578 million and 700 million by 2045.<sup>[1]</sup> Saudi Arabia is one of the middle east countries of high prevalence of diabetes mellitus. According to national studies, the prevalence rate of type 2 diabetes was around 25%.<sup>[2]</sup> In order to manage diabetes mellitus with high quality, it was observed that the Saudi MOH issued clinical guidelines, conducted training for health care providers, and provided PHC with relevant equipment and

infrastructures. On the other hand, Saudi Central Board for Accreditation issued a standards manual for PHCC accreditation with one chapter for chronic diseases including DM.<sup>[3]</sup> Many previous studies conducted for auditing diabetic care have used different standards.<sup>[4-6]</sup> To our recent knowledge, there was no published research regarding audit of DM care using CBAHI standards. The objective of this study is to assess the quality of diabetic care at Al-Manhal PHCC based on CBAHI standards.

## Methodology

After taking official permission from the Department of Research and Studies in General Directorate of Health Affairs, Aseer region, Saudi Arabia under the number of RES-2-8 on 18-4-2018, this audit was conducted by the investigators at

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Al-Manhal PHCC. This PHCC is one of the ten PHCCs in Abha city and serves about 20000 inhabitants. Diabetic care is provided by three family physicians and two trained nurses. The structures, process, and outcome of DM care were assessed by 2018 using CBAHI standards of chronic diseases.<sup>[3]</sup> During to CBAHI scoring guidelines were the following:

Each EC is scored on a four-point scale: 3 (Fully met when  $\geq 75\%$  compliance with the EC for 4 months prior to the initial survey or one year for the triennial survey), 2 (Partially met when  $\geq 50$  to  $< 75\%$  compliance with the EC or compliance for 3 months prior to the initial survey or 9 months for the triennial survey), 1 (Minimally met when  $\geq 25$  to  $< 50\%$  compliance with the EC or compliance for 2 months prior to the initial survey or 6 months for the triennial survey), 0 (Not met when  $< 25\%$  compliance with the EC or compliance is less than 2 months to the initial survey or less than 3 months for the triennial survey), and Not Applicable indicates that the standard/EC does not apply to the PHC.<sup>[3]</sup>

The assessment was conducted by one of the investigators who has experience in this regard. The standards for structure were availability of DM manual, teamwork, medical instruments, essential drugs, health education program, DM program, health information system, effective referral system, equipped laboratory, and follow-up system. Standards for procedures were as follows: Recording of demographics, recording of smoking status, and checking (weight-BMI, blood pressure, blood sugar, HbA1C, lipid profile, renal function, eye examination, and ECG).

Standards of outcomes were annual rate of visits, prevalence of obesity, diabetic control, blood pressure control, lipid control, rates of complications, rate of defaulters, and rate of smoking quitting. A master sheet was used to collect the above-mentioned data. Data coding, entry, and analysis were carried out using SPSS version 16.

## Results

### Structures

The standards and their score are shown in Table 1. It was found that most of standards of structures scored full points except, availability of medical instruments, health education program were partially met, while referral system scored one point.

### Procedures

Table 2 shows the points for each standard given for assessment of procedures, 50% of the relevant standards were fully met and the other partially met (HbA1C, lipid profile, renal function test, funduscopy and ECG).

A total of 429 health records were assessed. The mean of age was 59 year, more than half of patients were males, less than one-third were illiterate, and 85% were married [Table 3]. Procedure is shown in Table 4. Measuring weight, blood pressures, and fasting

**Table 1: Availability of infrastructures of DM care at Al-Manhal PHCC according to CBAHI standards, Abha, KSA, 2018**

Standards	Score
The primary healthcare center has a DM program manual	3
There is adequate and qualified staff to manage the DM program	3
The necessary tools and equipment are available	3
All DM drugs are available	3
There is a well-structured education plan for the patients and family	2
The DM program is implemented in the primary healthcare center	3
The primary healthcare center has a surveillance system for diabetes	3
There are health education materials	3
There is an effective referral system with feedback	1
There is a well equipped laboratory with relevant investigations	2

**Table 2: Demographic characteristics of diabetic patients at Al-Manhal PHCC, Abha, KSA, 2018**

Age (mean $\pm$ SD)	(59 $\pm$ 15 years)
Sex	
Male	216 (50.3)
Female	213 (49.7)
Marital Status	
Married	366 (85.3)
Single	23 (5.4)
Widow	38 (8.9)
Divorced	2 (0.5)
Educational status	
Illiterate	134 (31.2)
Elementary	9923)
Intermediate	69 (16.1)
Secondary	61 (14.2)
University +	66 (15.4)
Job	
Housewife	191 (44.5)
Teacher	35 (8.2)
Student	10 (2.3)
Military	14 (3.3)
Engineer	6 (1.5)
Retired	67 (15.6)
Jobless	29 (6.8)
Others	77 (18.5)
Smoking	
Yes	26 (6)
No	392 (91)
Ex-smoker	11 (3)

glucose was done for all patients, checking for HbA1C at least once was carried out for 70%, ECG (68%), funduscopy (69%), lipid testing (75%), and checking for creatinine (73%).

Regarding therapy, 141 (33%) were on oral hypoglycemic agents and insulin, 41 (56%) were on OHA, 45 (10%)

were on insulin only, while 2 patients were on diet. More than 2/3 (66%) of patient were on aspirin, and 61% used lipid-lowering agents.

## Outcomes

Relevant outcomes showed that 57% have obesity, 28% have good diabetic control, 71% have good HTN control, and less than 60% have good lipid control while rates of complications ranged from 1% to 14% [Table 4].

## Discussion

### Structures

In the last two decades, many audits were conducted in KSA using different tools and standards.<sup>[4-6]</sup> In the present audit, the CBAHI standards were first used. It is obvious that most of standards for infrastructures (7 standards) were fully met except for availability of well-structured education plan for the patients and family, effective referral system with feedback, and well-equipped laboratory, which were partially met the standards and scored 2 points for each. In this regard, previous studies reported that such items were very deficient.<sup>[4-8]</sup> In order to overcome such defects and to fill these important gaps, the high authorities in the public health department in the general directorate should have urgent executive plan.

**Table 3: Process of diabetic care at Al-Manhal PHCC, Abha, KSA, 2018**

Standards	Percentage	Score
Recording bio-data	100	3
Recoding smoking status	100	3
Checking weight and BMI	100	3
Checking blood pressure	100	3
Checking blood glucose	100	3
Checking HbA1C	70	2
Checking lipid	75	3
Checking urea, creatinine	72	2
Eye examination (fundoscopy)	69	2
ECG	68	2

**Table 4: Outcomes of diabetic care at Al-Manhal PHCC, Abha, KSA, 2018**

Standards	Percentage	Score
Average of annual visits (4-6) visits per year	3 visits per year	3
Good control of diabetes	28%	1
Good control of HTN	71%	2
Good control of lipid	54%	2
Good compliance with appointment	85%	3
Satisfaction with DM care among patient	Not done	0
Rate of complications		
CHD	19 (4%)	
Stroke	5 (1%)	
Renal impairment	14/311 (4.5%)	
Diabetic foot	8 (2%)	
Retinopathy	42/295 (14)	

## Procedures

Patients' records were assessed for the process of diabetic care. It was found that recording of all bio-data and vital signs was documented in all files, which was better than reported in the previous studies from Aseer, Qassim, and Riyadh<sup>[7,4,6,9]</sup> but less than conducted in UK.<sup>[9]</sup> The defects in laboratory and referral system were reflected on the relevant items of process particularly annual investigations (kidney function test, lipid profile, HbA1C, ECG, and fundoscopy), which were not done for about 1/3 of patients. However, the findings of this audit showed improvement as compared to that reported from the same center in 2009 in which kidney function tests, lipid profile, and eye examination were conducted for 40%, 39%, and 38%, respectively. In Qassim region, kidney function test was done for all diabetics, lipid profile was done for 92%, while eye examination was conducted for 17.6%. In a study conducted by Al-arfaj in armed forces hospital in southern region, lipid profile was done for the majority of patient (72%) while renal function test and fundoscopy were done for 29% and 35%, respectively.<sup>[10]</sup> In Dammam city, Ba-Essa *et al.* assessed the processes of diabetic care for 792 individuals in 2012 and 2016 and reported excellent processes of care as KFT, lipid profile, and eye examination were done for more than 97% of the diabetic patients.<sup>[11]</sup> In Bahrain, Al-Baharna *et al.* conducted a study and included 287 diabetic patients in military hospitals and they found that lipid profile, KFT, and eye examination were done for 95.5%, 97%, and 42%, respectively.<sup>[12]</sup>

## Outcomes

Aims of the DM program are to have good metabolic control, minimizing the risk factors and complications. Despite the low rate of DM good control (28%), most of patients were found to have optimal therapy including insulin (40%), aspirin (66%), and statin (61%). In a previous study from the same center, the good metabolic control was achieved among 30% compared to 21% in Qassim region and 18% in Riyadh region and 35% in UK.<sup>[5,4,9]</sup> In Dammam, good control was improved from 9% in 2012 to 37% in 2016, while study from Bahrain reported 32%.<sup>[12]</sup> In UAE, Shehab *et al.* reported very high figure (73.6%) after 6 months of continuous care of 254 diabetic patients.<sup>[13]</sup> In comparison study which was conducted among 200 diabetics in internal medicine department, Riyadh city and Diana Prince center, UK, good diabetic control was 18% and 35%, respectively. In another survey "The Gulf DiabCare" which included 1290 diabetic patients from KSA, Kuwait, and UAE, the good metabolic control was reported among 37% of the total sample study.<sup>[14]</sup>

In a recent large analysis of diabetic care in England which included 2.7 million diabetic patients, a high good metabolic control was reported among 66.9% of patients and they found that good control was affected by type of used medications particularly the new oral anti-diabetic agents.<sup>[15]</sup>

Such difference in metabolic control is expected as the cut-off point, patients' compliance, and other patients' characteristics are

different. Whatever the underlying reason, it is very mandatory to review the plan of care and to determine objective for each patient in order to achieve high target of good DM control. The average of the visit to PHCC was 3, which is lower than acceptable number of visit (4 per year); this low rate of visits to family doctors could contribute to poor compliance with appointment, drugs, and lifestyles, which may significantly lead to poor diabetic control and complications. Rates of co-morbidities are common, 57% have obesity, 55% have dyslipidemia, and 30% have hypertension. These findings are comparable to that reported from Qassim region, as obesity and hypertension were documented among 50% and 35% but higher than that reported from UAE (29% and 26%, respectively).<sup>[13]</sup> In Riyadh, Almutairi *et al.* reported that 56% have obesity, 44% suffer from hypertension, and 32% have lipid disorders.<sup>[6]</sup>

Rates of DM complications in this study were CHD (4%), stroke (1%), nephropathy (4.5%), diabetic foot (2%), and retinopathy (14%). These rates were higher than that reported earlier; retinopathy (5%), diabetic foot (0.2%), and similar for some complications that reported by Al-arfaj from southern region; retinopathy (17.9%), nephropathy (13.3%), CHD (6.6%), and neuropathy (4.8%).<sup>[10]</sup> In “The Gulf DiabCare,” rates of complications were higher than our study; about 40% had retinopathy, 34.9% had neuropathy, 8.9% had CHD, 6% had diabetic foot, and 34% had nephropathy.<sup>[14]</sup> A study conducted in southern region of KSA, the diabetic retinopathy was reported among 27.8%,<sup>[16]</sup> while the rate of neuropathy was 19.9% as reported by Wang *et al.*<sup>[17]</sup> A study conducted by Al-Rubeaan *et al.* and included about 55, 000 diabetic patients revealed that about 11% had diabetic nephropathy.<sup>[18]</sup> The variations in the rates of complications in these studies have many explanations including duration of DM, metabolic control, associated other risk factors, incomplete documentation of such complications in patients file in addition to different health care settings as reported from South Africa and India.<sup>[19,20]</sup>

We noted that the standards of outcomes were lacking in CBAHI manual which made some difficulties to compare our findings; hence, we suggest that such standards should be discussed by experts in the field of diabetology and family medicine and to be added in the next version of CBAHI manual.

Quality and DM control face many different challenges as reported by Almutairi in his review which need teamwork and more collaborative effort between health care providers and patients.<sup>[21]</sup>

## Conclusion

This audit revealed that using CBAHI standards for DM care at PHCC is simple and practical and could help to identify the weak areas that need improvement. The current version of CBAHI manual for chronic diseases needs updating and adding standards for outcomes. The present care of DM in our PHCC has acceptable infrastructures except for health education

program, laboratory, and coordination with hospital for referral system, which should be scaled up to improve the processes and outcomes. Patients’ satisfaction was lacking and such area should be explored in future studies.

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## Conflicts of interest

There are no conflicts of interest.

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