# Effect of integrated care services in Glycemic Control and Diabetic Nephropathy

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## Abstract

**Background:** Primary Health Care (PHC) systems have a crucial role in disease prevention and management. Most diabetic patients receive care from primary care physicians. The efforts of primary care physicians are hindered by many challenges such as long intervals visits, clinical inertia, and limited times with patients. Therefore, it is difficult to include additional disease management techniques such as health education, life-style management, and psychological support which proved to have substantial impact in reducing the risk of complications in diabetes. Many international guidelines have started to emphasis the need for comprehensive care for people with diabetes by the implementation of diabetes management through integrated medical care.

**Objective:** to assess the impact of integrated health care services on glycaemic and diabetic nephropathy.

**Study Design:** Interventional parallel-group clinical study

**Results:** The results showed increase in the number of patients with HbA1c <7% (53mmol/mol) by 6.6% (31 patients) and 17.6% (83patients) with HbA1c <8 (64 mmol/mol). the total number of patients with diabetic nephropathy before enrollment was 111(19.5%) distributed as follows (82.9%, 14.4% and 2.70% had microalbuminuria, macroalbumin urea and nephritic stage respectively). After enrollment the number decreased to 100(17.6%). 78% (78patients) had microalbuminurea, 20% (20 patients) had macroabuminurea and only 2% (2 patients) had nephrotic syndrome.

**Conclusion:** The utilization of multidisciplinary health care program with Enablement should receive more attention and recognition, especially, in countries with high prevalence of DM like KSA. Using clinical parameters with the concentration on major diabetes mellitus complications can reduce the risk of developing these complications significantly.

**Keywords:** Sudan, Egypt, Israel, Darfur, Refugees, UNHCR, Muatafa Mahmud, Traffickers, Sinai

## Introduction

Primary Health Care (PHC) systems have a crucial role in disease prevention and management in many countries(1). Most diabetic patients receive care from primary care physicians (PCPs)(2). The efforts of PCPs are hindered by many challenges such as long intervals visits, clinical inertia, and limited times with patients(3). Therefore, it is difficult to include additional disease management techniques such as health education, life-style management, and psychological support which proved to have substantial impact in reducing the risk of complications in diabetes(4). Many international guidelines have started to emphasis the need for comprehensive care for people with diabetes by the implementation of diabetes management through integrated medical care(5). One of the important aspects of integrated medical care is the multidisciplinary team approach, which takes into account the integrated management of microvascular and macrovascular risks rather than only focusing on glycemic control(6).The implementation of such approach has proven successful in improving diabetes care in primary care patients(7). We have reported a successful integrated care program in improving diabetes management in Saudi Arabia(8).

Glycemic control is vital to the management of T2DM as glucotoxicity worsens beta-cell dysfunction, with consequent disease progression and onset of complications(7). According to the Diabetes Control and Complication Trial these complications correlate with the HbA1c level, and every one percent reduction of HbA1c lowers the risk of developing retinopathy, nephropathy, and neuropathy by 40%(9). About 10% of people with diabetes develop early signs of CKD in the first 10 years after diagnosis, between 20–30% over the next 20 years after diagnosis. In the early stage of kidney disease, early detection is key since there are typically no signs or symptoms and the disease can be treatable and reversible(10).

The Integrated care services at Chronic Diseases Center (ChDC) in Al-Wazarat Primary Health Care Center, KSA enrolled all poor controlled glycemic control HbA1c>10 (86 mmol/mol). Enrolled patients had to be seen all members of the program team during the period of enrollment (Diabetic educator, dietitian, PCP, and clinical Pharmacist). The diabetic educator and dietitian had to be seen at least once by the patient. The PCP should be visited every three months per American Diabetes Association (ADA) guidelines. The clinical pharmacist duties include working as case manager responsible for arranging required appointments with other specialties as per the care regime as well as evaluating the compliance and adverse effects of the new regime, through at least weekly appointments in the first three months. The integrated care services at ChDC enrolled 471 patients and showed very good impact on clinical parameters and nephropathy complication.

The results showed increase in the number of patients with HbA1c <7% (53mmol/mol) by 6.6% (31 patients) and 17.6% (83patients) with HbA1c <8 (64 mmol/mol) (Figure 1). The number of patients with controlled LDL<2.59 was 353 (62%), the LDL was checked after enrollment, hence, there is no benchmark for comparison. Nonetheless, we believe that this percentage of patients with controlled LDL is very encouraging.

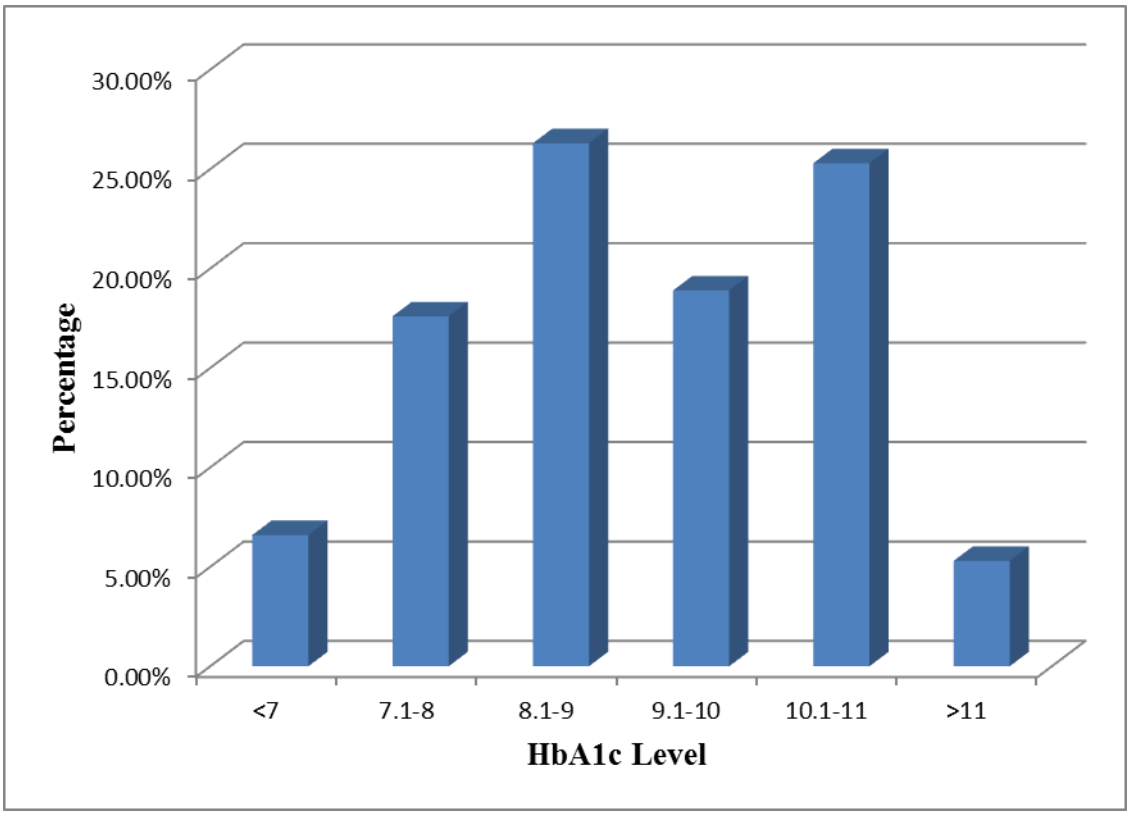


Figure 1: Diabetic patients HbA1c level distribution after the enrollment in the integrated health care program

Moreover, the influence of integrated care is observed on diabetic nephropathy complication, the total number of patients with diabetic nephropathy before enrollment was 111(19.5%) distributed as follows (82.9%, 14.4% and 2.70% had microalbuminuria, macroalbumin urea and nephritic stage respectively). After enrollment the number decreased to 100(17.6%). 78% (78patients) had microalbuminurea, 20% (20 patients) had macroabuminurea and only 2% (2 patients) had nephrotic syndrome.

Only 79 out of 471(16.7%) patient had chronic kidney diseases and 51 patients out of 79 had both nephropathy and chronic kidney diseases with 58 patients categorized as stage 3 CKD , and 8 patients as stage 4 ,while 5 patients as stage 5 per KDOQI CKD classification. These results indicate that reducing the progression of albuminuria and the preservation of the kidney function are mutually related, which may result an integrated indicator for renal and cardiovascular risk reduction.

The utilization of multidisciplinary health care program with Enablement should receive more attention and recognition, especially, in countries with high prevalence of DM like KSA. Using clinical parameters with the concentration on major diabetes mellitus complications can reduce the risk of developing these complications significantly. For instance, the screening and evaluation of diabetic nephropathy with quantitative measures of proteinuria should be a priority

for clinicians. Such approach may increase the efficiency of the early detection of kidney diseases in diabetic patients and may prevent or delay the development of End Stage Kidney Disease (ESKD).

## References

1. Green LW, Brancati FL, Albright A, Group tPPoDW. Primary prevention of type 2 diabetes: integrative public health and primary care opportunities, challenges and strategies. Family Practice. 2012;29(suppl 1):i13-i23.

2. Willens D, Cripps R, Wilson A, Wolff K, Rothman R. Interdisciplinary team care for diabetic patients by primary care physicians, advanced practice nurses, and clinical pharmacists. Clinical Diabetes. 2011;29(2):60-8.

3. Roumie CL, Elasy T, Wallston KA, Pratt S, Greevy RA, Liu X, et al. Clinical inertia: a common barrier to changing provider prescribing behavior. Joint Commission Journal on Quality and Patient Safety. 2007;33(5):277-85.

4. Ofori SN, Unachukwu CN. Holistic approach to prevention and management of type 2 diabetes mellitus in a family setting. Diabetes, metabolic syndrome and obesity: targets and therapy. 2014;7:159.

5. Association AD. Standards of Medical Care in Diabetes—2013. Diabetes Care. 2013;36(Supplement 1):S11-S66.

6. Harrison LB, Adams-Huet B, Raskin P, Lingvay I. β-cell function preservation after 3.5 years of intensive diabetes therapy. Diabetes care. 2012;35(7):1406-12.

7. Antoline C, Kramer A, Roth M. Implementation and methodology of a multidisciplinary disease-state-management program for comprehensive diabetes care. The Permanente Journal. 2011;15(1):43.

8. Al Asmary SM, Tourkmani AM, Al Khashan HI, SBFM A, Al-Qahtani H, Mishriky A, et al. Impact of integrated care program on glycemic control and cardiovascular risk in adult patients with type 2 diabetes. JCOM. 2013;20(8).

9. National Collaborating Centre for Chronic C. National Institute for Health and Clinical Excellence: Guidance. Type 2 Diabetes: National Clinical Guideline for Management in Primary and Secondary Care (Update). London: Royal College of Physicians (UK) Royal College of Physicians of London.; 2008.

10. Centers of Disease Control and Prevention. Diabetes FactSheets Atlanta, USA: CDC; 2014 [cited 2015 3/10]. Available from: http://www.cdc.gov/diabetes/library/factsheets.html.