

# Effect of integrated care services on glycemic control and cardiovascular risk factors

<b>Submission date</b>	<b>Recruitment status</b>	<input type="checkbox"/> Prospectively registered
17/08/2016	No longer recruiting	<input type="checkbox"/> Protocol
<b>Registration date</b>	<b>Overall study status</b>	<input type="checkbox"/> Statistical analysis plan
19/09/2016	Completed	<input checked="" type="checkbox"/> Results
<b>Last Edited</b>	<b>Condition category</b>	<input type="checkbox"/> Individual participant data
14/02/2018	Nutritional, Metabolic, Endocrine	

## Plain English summary of protocol

### Background and Aim

Saudi Arabia has one of the highest number of people with diabetes in the world, with studies estimating that approximately 24% of the population have the condition. This is around three times more than the world's average. In addition to risks of developing further disease and even death, type 2 diabetes (T2DM) take up a lot of healthcare resources and costs. Diabetes is known to significantly increase the risk of vascular diseases such as heart diseases and stroke. This risk can be prevented or at least delayed by intensive glycemic (blood sugar) control along with the control of associated risk factors such as hypertension (high blood pressure). However, many T2DM patients do not adequately follow the measures needed to prevent this risk. Most patients with T2DM are managed by primary care physicians (general practitioners). However, long gaps between patient visits and limited time with patients can result in clinical inertia (for example lack of increasing treatments as needed) and consequently less than optimal achievement of treatment goals. Several strategies have been described to overcome barriers to efficient diabetes management at primary care settings, including a multidisciplinary team approach for diabetes management. This approach has been proven to be successful in improving diabetes care in primary care patients. The aim of the current study was to test the impact of a multidisciplinary diabetic care program on glycated hemoglobin (HbA1c – a test to measure the average amount of sugar in the blood over a three month period) and cardiovascular (for example heart) risk factors among patients with poorly controlled T2DM in a primary care setting.

### Who can participate?

Adults with poorly controlled type 2 diabetes

### What does the study involve?

Participants are randomly allocated to one of two groups. Those in group 1 (control group) are given standard medical care from their family physician. Those in group 2 (intervention group) are enrolled into a multidisciplinary care program. Each participant is treated by a multidisciplinary team which includes family medicine physicians, clinical pharmacist specialists, a diabetes health educator, a dietitian, and a social worker. All participants in both groups are followed up for approximately ten months, during which time their HbA1c levels are regularly measured.

What are the possible benefits and risks of participating?

Participants in the intervention group may find that their glycemic control has improved. There are no risks to the participants as standard care is included in both groups.

Where the study run from?

The Al-Wazarat Healthcare Center (Saudi Arabia)

When is the study starting and how long is it expected to run for?

October 2013 to January 2015

Who is funding the study?

Prince Sultan Military Medical City (PSMMC)

Who is the main contact?

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## **Additional identifiers**

### **Protocol serial number**

SA555

## **Study information**

### **Scientific Title**

The impact of integrated care program on glycemic control and cardiovascular risk factors in adults patients with type 2 diabetes at Al-Wazarat Healthcare Center (WHC) in Saudi Arabia: an interventional parallel-group controlled study

### **Study objectives**

Integrated care is more efficient in glycemic control and reducing cardiovascular risk factors than standard care in type 2 diabetic patients.

### **Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Research ethics committee at Prince Sultan Military Medical City (PSMMC), 12/02/2014, ref: 555

**Study design**

Interventional randomized parallel-group double-blinded controlled single-centre trial

**Primary study design**

Interventional

**Study type(s)**

Prevention

**Health condition(s) or problem(s) studied**

Type 2 diabetes mellitus

**Interventions**

264 poorly controlled type 2 diabetes patients were randomly assigned to either a control or intervention group.

The control group consists of patients who received standard medical care. The patients in this group worked with their family medicine physician only.

The intervention group consists of patients who were assigned to work with a multidisciplinary care program. The multidisciplinary team consists of family medicine physicians (standard care), clinical pharmacist specialist (severed as cases Manager), a diabetes health educator, a dietitian, and a social worker. The roles of the diabetes health educator, dietitian, and social worker are as follows:

**Diabetes health educator roles:**

It is an interactive – collaboration ongoing process that involves the person with diabetes and the educator.

1. Assessment of individual specific educational needs
2. Explanation of the nature of the disease
3. Explanation of the interaction between foods, exercise, and medication.
4. Assessment and collaboration on an individual plan of care
5. According to individual needs, the most appropriate standing point will be determined
6. Education and behavioral intervention directed towards helping to achieve self-management goals.
7. Explain insulin injection instruction with a demonstration.
8. Medication instruction
9. Prevention and management of hypo & hyperglycemia.
10. Explain demonstrate self-glucose monitoring, urine testing for between and interpretation of results
11. Explanation of Ramadan, Haj and traveling management
12. Foot care, daily assessment, and action to be taken in case of a problem
13. Discussion of long term complication including screening for early intervention
14. Evaluate patient if able to learn the desired behavior
15. Evaluate the program if its goals and objectives are achieved

**Role of dietitian:**

1. Assess patient's dietary habits
2. Planning dietary regimes to suit the needs of each patient case-by-case
3. Modify wrong patient conception about diet
4. Monitor weight and advice accordingly

**Social Worker Role:**

1. Assisting patients with financial issues
2. Facilitate the treatment of physically challenged patients (wheelchairs, home visits, etc.)

**Randomization process:**

Each patient was given a unique number (1 - 264). A computerized random number generator programmed to generate 132 numbers between 1 and 264. This sequence was agreed on priory as the control group, the remaining 132 numbers not chosen by the generator are considered the intervention group. The patients and outcomes assessors (laboratories, family medicine physicians, nurses who work at the Chronic Disease Department) were blinded to randomization process.

**Follow-up period:**

The participants were followed-up for a median of 10 months between March 2014 and February 2015.

**Intervention Type**

Other

**Primary outcome(s)**

1. Glycated hemoglobin (HbA1c), measured from blood samples taken at baseline, 3, 6 and 9 months.
2. Lipid profile (HDL-cholesterol, LDL-cholesterol, Triglycerides), measured using commercial equipment (Dimension®, Dade Behring, Germany) at baseline, 3, 6 and 9 months

**Key secondary outcome(s)**

1. Fasting plasma glucose (FPG), measured using the fasting plasma glucose test using blood samples taken at baseline, 3 months, 6 months, and 9 months
2. Blood pressure, measured using a validated automatic sphygmomanometer (OMRON M4-I) when the participant is in a sitting position (weekly measurement for 9 months)
3. Weight measured in kg on a scale
4. BMI, calculated as the ratio between weight and height (kg/m<sup>2</sup>) at baseline, and 9 months
5. Serum cardiac troponin T (cTnT) and Creatine Kinase MB Isoenzyme (CK-MB), from blood taken at baseline, 3, 6, and 9 months

**Completion date**

29/01/2015

## Eligibility

**Key inclusion criteria**

1. Age 18 and older
2. Diagnosed with Type 2 Diabetes Mellitus
3. Receiving care at the WHC
4. Had at least two clinic visits before the study
5. Can provide informed consent

6. Poor glycemic control (HbA1c level >10) (86 mmol/mol) or persistent elevation of HbA1c >8 (64 mmol/mol) for one year or more)
7. Failure to respond to therapeutic insulin dose of > 2 units/kg or 200 units irrespective of weight
8. Inadequate adherence to insulin
9. Uncontrolled hypertension or hyperlipidemia with a maximum possible combination of medications
10. Comorbidity such as cardiovascular, renal, or hepatic disease
11. Inadequate continuity of care (such as recurrent missed appointment for insulin titration)

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Sex**

All

**Key exclusion criteria**

1. Type 1 Diabetes Mellitus (these patients receive care from the Endocrinology department which will compromise the standardized level of care)
2. Type 2 Diabetes Mellitus patients who receive care from Endocrinology department or other departments
3. Patients younger than 18 years old
4. Patients who cannot provide informed consent

**Date of first enrolment**

28/02/2014

**Date of final enrolment**

28/01/2015

## Locations

**Countries of recruitment**

Saudi Arabia

**Study participating centre**

The Al-Wazarat Healthcare Center (WHC)

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## Sponsor information

**Organisation**  
Prince Sultan Military Medical City

**ROR**  
<https://ror.org/00mtny680>

## Funder(s)

**Funder type**  
Hospital/treatment centre

**Funder Name**  
Prince Sultan Military Medical City (PSMMC)

## Results and Publications

### Individual participant data (IPD) sharing plan

#### IPD sharing plan summary

Data sharing statement to be made available at a later date

#### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	02/01/2018		Yes	No
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes