

Original Research Article

# A study on adherence to dietary guidelines, treatment and preventive care among diabetic patients

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	International Archives of Integrated Medicine, Vol. 3, Issue 5, May, 2016. Copy right © 2016, IAIM, All Rights Reserved. Available online at <a href="http://iaimjournal.com/">http://iaimjournal.com/</a> ISSN: 2394-0026 (P)                      ISSN: 2394-0034 (O)
	Received on: 03-05-2016                      Accepted on: 11-05-2016 Source of support: Nil                              Conflict of interest: None declared.
	<b>How to cite this article:</b> Gundala S, V.V. Sastry, T. Manmohan, V. Geeta. A study on adherence to dietary guidelines, treatment and preventive care among diabetic patients. IAIM, 2016; 3(5): 166-173.

## Abstract

**Back ground:** It is human tendency to obey doctor's advice to get relief from suffering, however once the symptoms subside they don't follow instructions. In case of chronic diseases such as diabetes, hypertension, cerebrovascular disease the treatment is lifelong and for a quality life the patients suffering with chronic problem should adhere to the treatment guidelines in strict compliance. Unless patient understands the importance of adherence to treatment guidelines it is very difficult to prevent various complications due to diabetes.

**Objectives:** To find out factors responsible for non adherence to treatment and dietary guidelines among type 2 diabetes patients.

**Materials and methods:** 200 known diabetic patients attending diabetic clinic in a teaching hospital were subjected to a pre tested questionnaire and information was collected by interviewing the patients.

**Results:** A total of 200 (101 male and 99 female) patients were studied and assessment of adherence to dietary guidelines and treatment regimen in terms of demographic, anthropometric, nutrition survey, treatment and preventive and personal care was done. Adherence to dietary and treatment guidelines was significantly high in literate group to that of illiterate group, with 'p' value < 0.0005. Strong family history in male sex with chi square value after Yates correction 19.49 and 'p' value was <0.00001.

**Conclusion:** Compliance or adherence problems are common in diabetes management. Many factors are potentially related to these problems, including demographic, psychological, social, health care provider and medical system, and disease- and treatment-related factors. Literacy is showing a positive impact as higher the literacy, higher is the adherence for treatment guidelines.

### Key words

Adherence, Compliance, SMBG, Diabetic complications.

### Introduction

It is human tendency to get relief from suffering, and at that point of time they are ready to do anything such as taking injections, oral pills, fasting, avoiding certain foods etc. However once symptoms subside they don't follow physician instructions. For acute problems such as infections and injuries this is acceptable, but for chronic diseases especially non-communicable diseases such as diabetes, hypertension, cerebrovascular disease the treatment is lifelong to avoid recurrence or further progression of disease with its attendant complications.

Regimen adherence problems are common in individuals with diabetes, making glycemic control difficult to attain. Because the risk of complications of diabetes can be reduced by proper adherence, patient non adherence to treatment recommendations is often frustrating for diabetes health care professionals [1]. For a quality life the patients suffering with chronic problem should adhere to the treatment guidelines in strict compliance. Diabetes is one such disease which tends to give patients a false sense of well being even with hyperglycemia, and unless patient understands the importance of adherence to treatment guidelines it is difficult to prevent complications due to diabetes.

### Materials and methods

200 known diabetic patients attending diabetic clinic in a teaching hospital were subjected to a pre-tested questionnaire and information was collected by interviewing the patients. Responses of patients to the questionnaire were analyzed using appropriate statistical tests and conclusions

derived from the study were recommended for better management of disease under study.

### Results

Adherence to treatment guidelines results were as per **Table – 1**. The study revealed that adherence to dietary and treatment guidelines was significantly high in literate group to that of illiterate group, with 'p' value < 0.0005.

**Table - 1:** Effect of literacy on adherence to treatment.

Literacy	Adherence to treatment	Non adherence to treatment	Total
Illiterates	21	54	75
Literates	120	5	125
Total	141	59	200

**Chi square value is 100.98 and p value is <0.00005 (highly significant)**

Physical activity practice in India over all is very poor irrespective of geographic and educational backgrounds in this regard. The practice of physical activity in the present study group observed as per **Table – 2**.

**Table - 2:** Practice of physical activity in male and female patients.

Physical activity	Males	Females
Sedentary	20	20
Mild to moderate	73	76
Hard	8	3
Total	101	99

Tobacco and alcohol are two notorious agents prone for addiction. The prevalence of smoking

in India is estimated around 30% in males and at around 2.5% in females [3] according to NFHS – II survey (1998-1999). In the present study, there were 21 male and 4 female smokers, and it was found that all smokers have co-morbid conditions like hypertension and stroke, which was very significant as against same complications in non smoker diabetic patients. Alcohol consumption is estimated at 18.8% [4] in a study of “alcohol consumption among middle aged and elderly men” by Prakash, et al., and the same pattern is reflected in this study too with 35 males and 2 females out of total 200 patients.

Family history of type 2 diabetes is a major risk factor for type 2 diabetes in young, which is increasing. Family history of type 2 diabetes in children is associated with decreased insulin sensitivity and clearance and an impaired relationship between insulin action and  $\beta$ -cell compensation. Detection of these alterations in hormonal and metabolic parameters in children with a positive family history suggests that at least some of the determinants are of genetic are heritable [5].

Results in the present study showed a strong family history in male sex, with chi square value after Yates correction 19.49 and ‘p’ value was <0.00001, indicating very high significance. 62 out of 101 male patients showed family history with either of or both parents, where as in females it was observed in 29 subjects out of 99 total females as per **Table – 3**.

**Table - 3:** Effect of family history on sex of patient.

Sex	Positive family history	Negative family history	Total
Male	62	39	101
Female	29	70	99
Total	99	109	200
<b>Chi square value is 19.49 and p value is &lt;0.00001 (highly significant)</b>			

In the present study, 40 out of 101 males and 53 out of 99 females scored BMI of over and above 25.1 kg/m<sup>2</sup>. Adherence to the dietary and treatment guidelines are studied based on the responses of patients to questions such as presence or absence of diet apathy, consultation with dietician, social habit of eating and usage of artificial sweeteners etc., Though tackling diabetes begins with dietary restrictions, there was no diet apathy seen in majority of patients. 158 out of total 200 patients did not report presence of diet apathy; however 26 out of 101 males and only 4 out of 99 females reported diet consultation.

Most of the patients were taking breakfast alone (134/200) and lunch alone (64/200), dinner alone (33/200). In spite of publicity in media regarding usage of artificial sweeteners only 37 out of 200 patients told about usage of artificial sweeteners. The habit of taking fruits daily is very less in Indians; to make it worse diabetics are warned of fruit servings with meals for causing hyperglycemia. Except for few selected fruits of high glycemic index such as banana, mango, sapota (chikoo), diabetic patients can take many fruits for want of beneficial effect of fruit consumption. In this study only, 44 subjects reported fruit servings, most of them either occasionally or seasonal fruit servings only.

Rice is staple diet in south India, but many of the diabetic patients are using wheat also as a major component of diet. Because of poor knowledge regarding diet and added to that various myths associated with diet consumption among people dietary guidelines were not followed by patients. More than 30% of patients cited reasons such as ignorance; living alone, lack of motivation, negligence, lack of energy and associated financial burden for not able to follow the dietary guidelines. Adherence to treatment depends mainly on patients themselves, as seen in this analysis, only 45 males and 23 female patients were self motivated where as the remaining 132 patients were motivated by family members and health care provider (**Table - 4**).

**Table - 4:** Sex wise distribution of health care provider.

Health care provider	Males	Females
Self	8	6
RMP/PMP	4	3
General Practitioner	50	56
Specialist	36	33
Others	3	1
Total	101	99

In the present group the patients were suffering from diabetes for as low as 1 year to as high as 40 years. Maximum of 155 patients were diagnosed and under treatment in the group ranging from 5 to 25 years. Very few patients i.e., only 5 patients were living with diabetes beyond 35 years after diagnosis, reflecting poor compliance from patients resulting in high morbidity and early mortality. Ideally the treatment after first diagnosis should begin with dietary therapy along with exercise followed by life style modification, oral hypoglycemic agents and lastly insulin. The pattern of treatment given immediately after diagnosis was found as per **Table - 5**.

**Table - 5:** Sex wise distribution of treatment of initiation.

First treatment given	Males	Females
Diet alone	6	9
Diet and exercise	10	6
Diet and OHA	6	7
Diet and exercise and OHA	12	10
OHA	56	58
Insulin	5	2
Diet, Exercise, and Insulin	6	3
Insulin and OHA	-	4
Total	101	99

The beneficial effect of physical activity was evident in two patients who followed the advice on regular exercise did not need further treatment with OHA or insulin even after 15 years of diagnosis of the disease. 15 patients who were put on diet and exercise initially had to switch on

to OHAs within 6 months because of non adherence to dietary restrictions. 58 patients who were put on OHAs initially changed over to insulin within 2 months, because of poor compliance.

### Consultation

Frequency of consultation was sought regularly in 128 patients, while 65 patients went to physician when they are not well and remaining 7 patients did not take any consultation what so ever. 110 out of 200 patients (55%) patients experienced hypoglycemia and the symptoms noted include; sweating, giddiness, discomfort and confusion. Only 120 (60%) patients checked their blood sugar and many other tests periodically, while remaining 80 (40%) patients sought blood sugar testing when situation demanded. As low as 45 patients were doing self measurement of blood glucose levels periodically with a huge scope for awareness program on this aspect.

Information tag: Negligible number 5 males and 3 female patients are carrying the tag containing information of their diabetic status. Awareness regarding importance of carrying information tag and its usefulness in emergency or crisis situation of diabetic complications such as hypoglycemia and diabetic ketoacidosis is to be stressed very strongly. As many as 84 males and 80 female patients expressed feeling of mild to severe restriction of life because of diabetes and 64 males and 65 female patients expressed either some or severe disruption of family life. Nearly 52% of patients felt the disease as a burden on financial resource.

### Discussion

Diabetes is a challenging non communicable disease to manage. Although the treatment regimen is complex, patients with good self-care behaviors can attain good glycemic control. However, many patients do not achieve good glycemic control and continue to suffer health problems as a result. This project aims at documenting the extent of and factors related to

adherence problems among patients with diabetes. It has been generally acknowledged for years that non adherence rates for chronic illness regimens and for lifestyle changes are ~50% [6]. As a group, patients with diabetes are prone to substantial regimen adherence problems [7]. In general, research has shown that the diabetes regimen is multidimensional, and adherence to one regimen component may be unrelated to adherence in other regimen areas [7-9]. For example, research has shown better adherence for medication use than for lifestyle change [10]. In other studies, adherence rates of 65% were reported for diet<sup>7</sup> but only 19% for exercise [8].

Two studies showed that adherence to oral medications in patients with type 2 diabetes were 67% when measured by electronic monitoring [11, 12]. In a more recent study of older type 2 diabetic patients' adherence to sulfonylurea, adherence, when measured by pill counts, was 104% to a one-per-day regimen and 87% to twice- or thrice-daily regimens. However, electronic monitoring revealed reduced adherence rates of 94 and 57% for once-daily and twice- or thrice-daily regimens, respectively [13]. Self-monitoring of blood glucose (SMBG) has been used for > 25 years, with recent technological advances making the procedure very easy to use. Research has shown that increased SMBG is associated with improved glycemic control [14]. Despite the improved technology, patients do not adhere well to this aspect of the diabetes regimen.

A recent study using a large national sample of patients with type 2 diabetes found that 24% of insulin-treated patients, 65% of those on oral medications, and 80% of those treated by diet and exercise alone either never performed SMBG or did so less than once per month [15]. To improve patient adherence, it is important to understand why non adherence occurs. A substantial literature has documented a number of factors related to diabetes regimen adherence problems [16]. It is helpful to consider demographic, psychological, and social factors, as well as health care provider, medical system,

and disease- and treatment-related factors. Demographic factor such as low level of education is associated with lowered adherence and greater diabetes related morbidity [17]. For example lower rates of SMBG have been observed among minority African-American and Mexican-American patients [18].

Most health care providers use the term “compliance” instead of “adherence,” although these concepts are quite different. Compliance has been defined as “the extent to which a person's behavior coincides with medical advice [6]. Noncompliance then essentially means that patients disobey the advice of their health care providers. Patient noncompliance is attributed to personal qualities of the patients, such as forgetfulness, lack of will power or discipline, or low level of education. The concept of noncompliance not only assumes a negative attitude toward patients, but also places patients in a passive, unequal role in relationship to their care providers.

Adherence has been defined as the “active, voluntary, and collaborative involvement of the patient in a mutually acceptable course of behavior to produce a therapeutic result [20]. Implicit in the concept of adherence is choice and mutuality in goal setting, treatment planning, and implementation of the regimen. Patients internalize treatment recommendations and then either adhere to these internal guidelines or do not adhere. However, the concept of adherence has been criticized because of its focus on patients and because of the nature of the diabetes regimen itself, which is dynamic rather than static [21]. Furthermore, it is not useful to think of adherence as a unitary construct, but rather one which is multidimensional, because patients may adhere well to one aspect of the regimen but not to others. Non-adherence to prescribed drugs schedule has been and continues to be a major problem the world over.

Diabetes is considered to be one of the most psychologically and behaviorally demanding of the chronic diseases. It requires frequent self

monitoring of blood glucose, dietary modifications, exercise, and administration of medication on schedule. Studies have emphasized the importance of achieving optimal glucose control through strict adherence to medications, diet, and exercise in order to minimize serious long term complications. These complications affect the patient's quality of life, increase mortality, morbidity and economic cost to society. It is imperative that patients adhere to their prescribed regimens to minimize the burden of the disease on the health systems. Non-adherence in chronic diseases has been described as taking less than 80% of the prescribed treatment [22].

## **Conclusion**

Compliance or adherence problems are common in diabetes management. Many factors are potentially related to these problems, including demographic, psychological, social, health care provider and medical system, and disease- and treatment-related factors. Literacy is showing a positive impact as higher the literacy, higher is the adherence for treatment guidelines. It is observed that very few patients are doing considerable physical activity. Smoking and alcohol consumption among diabetic patients is as that of normal population, however the amount of morbidity appears to be very high, as evidenced by more number of hospitalizations among diabetics with habit of smoking and alcoholism.

Obesity is a major risk factor as well as co-morbid condition for diabetes. In the present study it is observed that many patients are with high body mass index, indicating poor adherence to dietary restrictions. Knowledge regarding glycemic index is very poor and diet planning is not observed at all. Even consultation with a dietician is not taken by many patients of the study group. Consumption of artificial sweeteners is very less, meaning a chance of high consumption of refined sugars in the regular diet and beverages. When it comes to treatment self motivation is seen in one third of patients,

remaining patients are forced by family members or other people to go for regular checking. Many people missed their dose because of sheer negligence most of the time and others because of ignorance of complications associated with their disease. Few other patients for want of magic remedy using other systems of medicine such as ayurveda and homeopathy.

More than half of patients developed one or other complication, because of lack of awareness and poor adherence to treatment regimen. Good numbers of patients were hospitalized and some of them rehospitalized for same problem, a bad sign considering the morbidity and mortality associated with the condition. Last but not least personal care and preventive practices are very poor in the study group, as evidenced by only 8 out of 200 patients were carrying the information tag, which is very useful during emergency situations associated with diabetes. Regular blood sugar testing, self monitoring of blood glucose needs to be stressed on diabetic patients.

## **Recommendations**

Considering the results of the present project there is definite improvement seen in terms of adherence to dietary restrictions and treatment guidelines, at the same time there are lot more things to be done to improve quality of life among diabetic patients by further increasing awareness among patients for harmonious living with disease diabetes.

- As literacy plays a major role for healthy living, literacy rate should be improved.
- Stress should be made on adapting physical activity as a part of life style.
- Special counselling program should be given to diabetic patients on ill effects due to smoking and alcoholism.
- Dietician consultation should be given at least up on for first time diagnosis of the condition.

- Artificial sweeteners consumption should be promoted, so that intake of refined sugars will be reduced spontaneously.
  - Wide publicity on screening, especially in high risk group, should be done to detect the diabetes early and tackle it with life style modification measures.
  - Even today many general practitioners are treating the diabetic patients, CME programs involving GPs to be conducted all over country and updating their knowledge helps a long way in health care of people.
  - Extensive IEC methods should be applied to attract more no. of general physicians to take up diploma courses in diabetology and increase human resource in order to meet increasing demand of the situation.
  - Periodic checking of diabetics for development of complications should be organized by special programs.
  - Taking benefit of patients stay in hospitalized individuals extensive counselling should be given for improved adherence and compliance.
  - Self monitoring of blood glucose practice should be improved among patients by giving subsidy on glucometers, so that every patient can use it.
  - Encourage carrying the information tag by stressing the vital use with it.
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Finally reduce the feeling of severe restriction of life and distress feeling associated with disease diabetes by making them adhere to dietary restrictions and treatment guidelines and improve quality of life of diabetic patients.

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