

Original Research Article

A STUDY ON ADHERENCE TO DIABETIC MEDICATION IN A RURAL  
AREA OF KANCHEEPURAM DISTRICT, TAMILNADU

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**Abstract**

**Background:** Diabetes mellitus is a growing global health problem that affects patients of all age groups. Adherence to anti-diabetic medicines has been found to be major challenge in the management of diabetes mellitus. This study aims at assessing the adherence to medication and to identify the factors associated with non-adherence to treatment of diabetes mellitus patients. **Objectives:** To assess the adherence to medication in the treatment of diabetes mellitus in the study population, to identify the factors associated with non-adherence to medication in the treatment of diabetes mellitus. and to determine association between adherence to medication and diabetic control in the study population. **Materials and Methods:** This study is a community based descriptive cross sectional study conducted in the field practice area of SBMCH; among 360 diabetic patients were studied using Simple random sampling method. Data collection was done using a structured questionnaire. The adherence to treatment was assessed using Morisky's medication adherence scale and the reasons for non-adherence were questioned. Percentage of adherence was calculated. **Results:** Among the 360 diabetic mellitus patients studied, males were 177(49.2%) and 183(50.8%) were females. The adherence to anti-diabetic medication was found to be only 35.8% and non adherence to anti-diabetic treatment was 64.2%. The reasons for non-adherence were identified as increased cost of treatment, side effects of the drugs, multiple drugs, opting to alternate treatments, lack of proper knowledge. **Conclusion:** The results of the study tell us that adherence to anti-diabetic drugs was low. Various reasons for non-adherence were identified. Hence it is necessary to recommend proper education of the patients and proper prescribing of drugs by physicians as intervention measures to combat non adherence.

**Key Words:**– Compliance, Diabetes Mellitus, Diabetic Drugs, Treatment.

**INTRODUCTION:**

Non communicable diseases (NCDs) also known as chronic diseases is a medical condition or disease that is not caused by infectious agents (non-infectious or non-transmissible). They are of long duration and generally slow in progression. The 4 main types of non communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes. Non communicable disease is the leading cause of death globally. Non communicable diseases (NCDs) kill 38 million people each year [1]. Almost three quarters of NCD deaths - 28 million occur in low and middle income countries. . The increase in rates in developing countries follows the trend of urbanization and lifestyle changes, including increasingly

sedentary lifestyles, less physically demanding work and the global nutrition transition, marked by increased intake of foods that are high energy-dense but nutrient-poor. Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from an NCD.

Diabetes mellitus is an iceberg disease and is one of the major non communicable diseases. It is characterised by a state of chronic hyperglycaemia. India ranks second next to China in the overall burden of diabetes. Diabetes may become world's seventh largest killer by 2030 as per WHO [2]. According to World Health Organization (WHO) report in 2016 [1], Diabetes currently affects 422 million worldwide and prevalence of diabetes is 8.5%. The fastest prevalence increase is expected to occur in Asia and Africa, where most people

with diabetes will probably live in 2030. In India more than sixty two million are affected by diabetes, the majority of the people have type 2 diabetes mellitus (90%). Nearly one million Indians die due to type 2 diabetes mellitus every year. In Tamil nadu the prevalence of diabetes is 9.8% and in total 42 million persons are affected by diabetes. 1 in 10 is diabetic in Tamil Nadu as per 2016 statistics [2].

India has more people with diabetes than does any other country in the world, according to the International Diabetes Foundation, although more recent data suggest that China now has more people with diabetes than does India. There are 3 main types of diabetes mellitus as per WHO, they are diabetes mellitus, impaired glucose tolerance and gestational diabetes mellitus. Treatment of diabetes mellitus includes medical management, lifestyle modification and surgery. Adherence to anti-diabetic medicines has been found to be a major concern.

This study aims at assessing the adherence to diabetic medications and to identify the factors associated with non-adherence in diabetes mellitus patients.

**MATERIALS AND METHODS:**

This study is a community based descriptive cross sectional study conducted in the rural field practice area (Padappai) of Sree Balaji Medical College and Hospital in Kancheepuram district, Tamil Nadu. The Study period is 3 Months (January to March 2017). The study population includes diabetic patients belonging to all age group and who are under medication for at least 6 months. Those not willing to participate in the study and those patients who are mentally retarded and Gestational diabetes mellitus patients were excluded from the study. Based on the study done by Uma Shankar in the year 2013 in a rural area of Kerala which recorded adherence to diabetes medication as 26%. The sample size was calculated at 95% confidence interval and keeping the precision as 5 using the formula  $4pq/l^2$  where p is 27.8, q is 72.2 and l is 5% of P. Also accounting 10% for non response the final sample size was adjusted to 360. From the 600 registered diabetes mellitus patients who are taking treatment from the field practice area 360 samples were selected using simple random sampling method with the help of computer generated random number tables. The study tool used consists of a pre tested structured questionnaire containing socio demographic details, details regarding treatment, Morisky's 4 item questionnaire. The data was entered in MS excel and analyzed using SPSS 15 version. Descriptive statistical analysis done by using the percentage, proportions and statistical association calculated using the chi-square test and p value estimation. Informed consent was obtained from all the participants of the study.

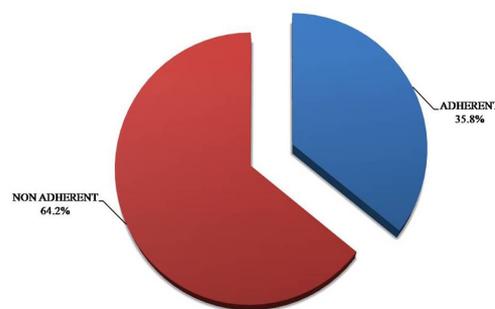
**RESULTS:**

Among the 360 diabetic mellitus patients studied, males were 177(49.2%) and 183(50.8%) were females. Most of the patients belonged to the age group of 40-60 years accounting for 50% (180). From the study adherence to diabetic medication was found to be only 35.8% (shown in FIGURE 1) and 64.2% were found to be non adherent to diabetic medication. On comparing the sex wise adherence percentage, females have better adherence of 60.5% compared to males whose adherence was only 39.5% (as you can see from FIGURE 2). On estimating age wise adherence levels the age groups were divided into 4 strata's 1-20 years, 21-40 years, 41-60 years and >60 years. Adherence was higher in the older age groups than the younger age groups. Non adherence was also comparatively higher in the older age group due to more disease burden in that age group than the younger counterpart. The socio demographic details of the study population are shown in TABLE 1.

**TABLE 1: SOCIO DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION**

| SOCIO DEMOGRAPHIC CHARACTERISTICS   |                           | FREQUENCY | PERCENTAGE |
|-------------------------------------|---------------------------|-----------|------------|
| AGE                                 | 0-20 Years                | 3         | 0.8%       |
|                                     | 21-40 Years               | 39        | 10.8%      |
|                                     | 41-60 Years               | 180       | 50%        |
|                                     | > 60 Years                | 138       | 38.4%      |
| SEX                                 | Male                      | 177       | 49.2%      |
|                                     | Female                    | 183       | 50.8%      |
| EDUCATION                           | Illiterate                | 59        | 16.3%      |
|                                     | Primary school            | 46        | 12.7%      |
|                                     | Middle school             | 40        | 11.1%      |
|                                     | Higher secondary          | 52        | 14.4%      |
|                                     | Post high school diploma  | 53        | 14.7%      |
|                                     | Graduate or post graduate | 47        | 13.05%     |
|                                     | Profession                | 63        | 17.5%      |
| DURATION OF DIABETES MELLITUS       | < 5 years                 | 150       | 41.7%      |
|                                     | 5-10 years                | 102       | 28.3%      |
|                                     | >10 years                 | 108       | 30%        |
| FAMILY HISTORY OF DIABETES MELLITUS | Yes                       | 198       | 55%        |
|                                     | No                        | 162       | 45%        |

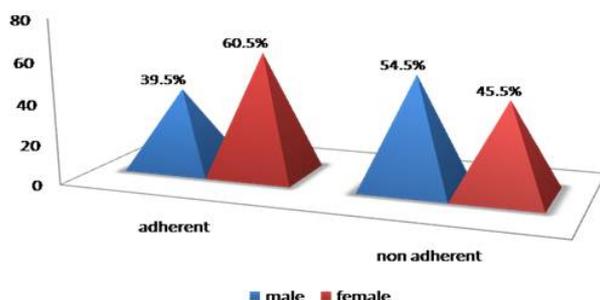
**FIGURE 1: PERCENTAGE OF ADHERENCE AND NON ADHERENCE**



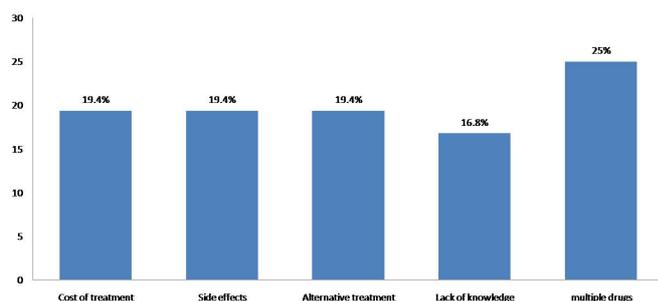
Common reasons for non adherence was identified from the study and they include multiple drugs, lack of knowledge, side effects due to medication, alternative medications and cost of treatment. Among these multiple drugs was the most common reason for non adherence accounting for 25%. Next comes cost of treatment, side

effects, alternative medication as reasons for non adherence with 19.4% each. Lack of knowledge was the least reason with 16.8%. Some other findings of the study are, 27.5% of the patients are taking government drugs and 72.5% patients are taking medications from private facility. And 55.5% of the patients had a positive family history of diabetes mellitus and 44.5% of the patients didn't have diabetes in the family. 55% of the patients had co morbidities and 45% had no co morbidities.

**FIGURE 2: FREQUENCY OF ADHERENCE IN BOTH SEXES**



**FIGURE 3: REASONS FOR NON ADHERENCE**



**TABLE 2: ASSOCIATION BETWEEN ADHERENCE TO DIABETIC MEDICATION AND DIABETIC CONTROL.**

| SUGAR VALUE | ADHERENCE |        | NON ADHERENCE |        | TOTAL     |      | Chi-Square value is 215.3 (Degree of freedom =1) |
|-------------|-----------|--------|---------------|--------|-----------|------|--|
|             | Frequency | %      | Frequency     | %      | Frequency | %    |  |
| <140 mg/dl  | 117       | 81.20% | 27            | 18.80% | 144       | 100% | P=0.000  |
| >140 mg/dl  | 12        | 5.50%  | 204           | 94.50% | 216       | 100% |  |
|             | 129       |        | 231           |        | 360       |      |  |

From the study we can also find that there was statistically significant association between the adherence to diabetic medication and diabetic control, p value was <

0.0001 which also supports this association between the adherence to diabetic medication and diabetic control. And the p value is highly significant. Among patients whose blood sugar value was less than 140 mg/ dl , 117(81.2%) were adherent to their diabetic medication and 27(18.8%) were non adherent to their diabetic medication. Good diabetic control among them was due to their strict adherence to diabetic medication. Among patients whose blood sugar was more than 140 mg/ dl, 12(5.5%) were adherent to their diabetic medication and 204(94.5%) were non adherent to their diabetic medication. The reason for their high diabetic value was their non adherence to diabetic medication.

**DISCUSSION:**

Adherence to medication is an essential part in the management of diabetes. Adherence is affected by socioeconomic status, literacy, memory of the patient, lack of proper knowledge and awareness, duration of therapy and certain other factors. Non adherence may lead on to poor diabetic control, worsen the disease and lead on to various complications of the disease.

The result of the study is consistent with results obtained from previous studies one such study was done in 2015 by Uma Shankar in a rural area of Kerala in which the adherence level was 26%, which is low [3]. In north India a study done by Sharma recorded the adherence as 16.6% [8], In Kolkata a study done by Mukherjee recorded an adherence of 57.7% [10]. In Tamil Nadu a study was done in the year 2014 by Elizabeth Mampally Mathew which recorded an adherence level of 50.1% [11]. In a study conducted in oromia of Ethiopia 68.8% respondents were adhered to anti-diabetic medication [16]. Mohammed ARIFULLA conducted a study in UAE in which adherence rate to anti-diabetic drugs was 84%. The most common reason for non-adherence was forgetfulness, and the adherence rate was similar in both genders [15]. In a study done in Tamil nadu by Prabhu and Ramya 30% had good adherence [17]. Another study done in north western Ethiopia by Mastewal Abebaw in 2015 the adherence was 85.1% which was very high compared to other studies. Manobharathi conducted a study in Chidambaram district of Tamil nadu in which the adherence percentage was 39.8% [18]. In a study conducted in Puducherry by Arulmozhi adherence was 49.3%. [19]. In another study conducted in Nigeria by Fatima Iyabo Abdulazeez the adherence was 26.4% [20]. The reasons for non adherence were also similar to the results obtained from other studies.

**CONCLUSION:**

The results of the study tell us that adherence to anti-diabetic drugs was only 35.8% in the study population.

Various reasons for non-adherence were identified in the study population. There was a positive statistical significant association between adherence to diabetic medication and diabetic control ( $p < 0.0001$ ). The poor adherence will definitely affect the health of the individual leading to many complications. Interventions aimed at building adherence in diabetic patients are very much essential to prevent further complications.

#### RECOMMENDATIONS:

From the results of my study as a community medicine professional I recommend proper motivation and education of the patients towards adherence and to inform them about the harmful effects and complications associated with non adherence through various available Medias. Physicians also should prescribe appropriate drug combinations in order to avoid side effects and multiple drugs. Creation of public awareness about diabetes and drug adherence through various health education campaigns and outreach activities at the community level. Coverage of the NCD control program should be increased and the strengthening of the health sector by allocating more funds on health promoting activities must also be done.

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#### LIMITATIONS:

Not all the reasons for non adherence was taken into account in this study and only the important reasons associated with non adherence were studied.

**Conflict of interest: Nil**

**Source of funding: Nil**

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