



DIABETES MELLITUS MODIFYING FACTORS; INVESTIGATION AMONG THE INHABITANTS OF SARGODHA CITY, PAKISTAN

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ABSTRACT... Objective: Diabetes mellitus is wide spread non transmissible disease but its prevalence is increasing everyday so this study was conducted with an aim to investigate the factors that are modifying diabetes mellitus among patients at DHQ (District Head Quarter) Hospital Sargodha. **Methodology:** A prospective study was carried out by well-trained pharmacists in DHQ Sargodha, Pakistan to assess the factors modifying diabetes mellitus. Data was collected from 110 patients randomly by using convenience sampling method. A well structured questionnaire was designed to collect information from patients and entire procedure was conducted with the permission of concerned authorities of Hospital management. The factors that are considered in present study are medication, treatment, patient physician interaction and society attitude towards diabetic patients which are helpful in halting the progression of diabetes and prevention of co morbidities. **Results:** The results of study disclose that 74.5% diabetic patients felt better after treatment whereas 56% diabetic patients were satisfied with the information provided by physician to them but still 70% patients were suffering from co morbidities. The survey indicated that 62.7% patients said that exercise proved to be healthy activity in improving diabetes. However 59% diabetic patients were following a proper diet plan which was helpful in modifying their diabetes. **Conclusions:** The diabetic patients must be informed about importance of regular follow-up in averting long-standing complications. Patients should be guided about importance of dietary recommendations, exercise and strict metabolic control, that can holdup or avert the series of complications allied with diabetes.

Key words: Prospective study, co morbidities, diabetes, dietary recommendations.

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INTRODUCTION

Diabetes Mellitus is one of the most widespread chronic non-transmissible ailments¹. It is well thought-out to be one of the most emerging community health problems in Middle Eastern countries². In accordance with world health organization (WHO) approximately 135 million people all over the world at present have diabetes and type 2 diabetes mellitus accounts for about 90% of these cases³. In Pakistan, it is estimated that 7 million people out of 140 million suffer from diabetes. In consistence with WHO estimations, Pakistan lies on 8th number in the prevalence of diabetes and by the year 2025 it is likely to rise to 4th position⁴.

The number of diabetic patients is rising gradually owing to population expansion, aging, increased incidence of obesity and diminished

physical activity⁵. Diabetes mellitus (DM) is a chronic metabolic syndrome described by hyperglycemia generally as a result of absolute (Type 1 DM) or relative (Type 2 DM) deficit of insulin hormone⁶. Every system of the body is affected mainly due to metabolic disturbances caused by hyperglycemia⁶. Diabetes, which can bring about chronic morbidities and mortality, is linked with distressing complications such as cardiovascular diseases, nephropathy, retinopathy and neuropathy⁷.

The main objective of diabetes management is prevention of hyperglycaemia and reducing all risk factors for macrovascular and microvascular diseases such as hypertension and dyslipidemia. Recently there have been a lot of studies signifying that along with improving diabetic control, life style changes, diet, exercise and pharmacological

treatment, there are other factors which place a diabetic at menace of developing complications and these needs to be directed when treating a diabetic patient⁸.

Self-care in diabetes is a gradual process of improvement of knowledge or awareness by learning about intricate nature of the diabetes⁹. Good outcomes in diabetic patients can be predicted by several essential self-care behaviours which includes eating healthy diet, being physically active, regular blood sugar level monitoring, medication compliance, and risk-reduction behaviors¹⁰.

The aim of the present study was to investigate the factors modifying Diabetes Mellitus including patient physician interaction, pharmacological interventions, patient adherence towards treatment regimen, patient's awareness about their disease, diet-diabetes relationship, influence of physical activity, socioeconomic factor.

METHODOLOGY

A prospective study was carried out by well-trained pharmacists in DHQ (District Head Quarter) Hospital Sargodha, Pakistan to assess the factors modifying diabetes mellitus. Data was collected from 110 patients randomly by using convenience sampling method. A well structured questionnaire was designed by trained personnels to collect information from patients that included questions based on all factors related to diabetes modification. The entire procedure was conducted with the permission of concerned authorities of Hospital management. The factors that are considered in present study are medication, treatment, patient physician interaction and society attitude towards diabetic patients which are helpful in halting the progression of diabetes and prevention of co morbidities.

RESULTS AND DISCUSSION

Factors modifying diabetes mellitus relevant to medication and treatment are discussed here as shown in Table-I. In current investigation only 57.3% of diabetic patients properly follow the prescription where as 42.7% diabetic patients

were unable to follow the prescription because of lack of education about self management, limited awareness about their disease, restricted access to health care facilities, inadequate nutrition and highly pitiable health behaviours such as smoking and alcohol consumption etc¹¹.

The study also reported that 54.5% of the patients were self-administering their medications. The reason for self-administration of medication is awareness of self-care among patients to improve their quality of life. Adherence to self administration of oral hypoglycemic agents is closely related with improvements in glycemic control of diabetic patients¹².

The results of present investigations showed that incidence of Type 2 DM is much more than Type 1 DM and 83.6% of people were suffering from type 2 diabetes. So the requisite of insulin administration accounts for only 24.5% of population. Non compliance to the insulin regimen among participants of our trial is owing to expensive, painful, difficult sub-cutaneous insulin injection technique¹³ and inaccurate knowledge about insulin handling and storage as was the case in our study i.e., just 20.9% participants were aware about proper handling and storage of insulin¹³.

In present investigation, only 36.4% patients were using glucometer to monitor their blood glucose level which represents the lack of awareness about the significance of glycemic control. Whereas self-monitoring of glycemic control is the keystone of diabetes management, which provides information about existing glycemic status, permit the consideration of therapy and guide about adjustments in exercise, diet plan and medication with an aim to attain optimal glycemic control¹⁴. 29.1% of patients in our survey revealed that they either reduced their insulin dose or stopped taking insulin because of the fear of hypoglycemia which was experienced by 42.7% of patients. Patients can recognize hypoglycemia by symptoms including difficult breathing, rapid pulse, throbbing heart, perspiration, feeling stressed, trembling, lightheadedness and weakness and by improving quality of life and regular insulin

administration, hyperglycemic state can be controlled¹⁵.

Factors Modifying Diabetes Mellitus	Pt's* who said Yes	Pt's who said No
Pts who follow prescription	57.3%	42.7%
Pts who self administer the medication	54.5%	45.5%
Pts who are using insulin	24.5%	75.5%
Pts who know proper handling and storage of insulin	20.9%	79.1%
Pts who use glucometer	36.4%	63.6%
Pts who know about proper use of glucometer	20.9%	79.1%
Pts who adjust dose with changing glucose level	29.1%	70.9%
Pts who suffer from hypoglycemic state	42.7%	57.3%
Pts who use another way to cure the disease	33.6%	66.4%

Table-I. Factors affecting Diabetes and Patients response to These factors

*Pts: Patients

The main obstacles for self monitoring of glucose level with glucometer are the painful procedures, shortage of expertise to handle the glucometer and the charges of reagent strips¹⁶. Therefore, healthcare providers should use their capabilities and aptitude to instruct the Diabetic patients to accurately monitor their glucose. Our survey depicts that 20.9% patients had proper awareness about use of glucometer and such a low percentage needs an initiative for adoption of home visits for the provision of directions about these techniques, which would lead to greater adherence to glucometer. Without sufficient diabetic education and practical orientation glucometer use at home proposes more damage than benefits to the health care system¹⁷.

Our study also revealed that 33.6% patients use other ways to cure disease. Diabetic patients most often use alternative medications including Ayurvedic and herbal medications as they are cheap and devoid of severe adverse effects as associated with allopathic medicines. In general

Ayurvedic physicians utilize a mixture of various herbs or proprietary preparations along with diet, exercise and life style changes that reduce glycosylated hemoglobin A1c (Hb1Ac level) and regulated normal sugar levels¹⁸.

Factors related to physician and society attitude towards diabetic patients are discussed subsequently as shown in Table-II. The results of our analysis reflect that only 29.1% patients frequently visit the doctor. The reason behind is ignorance about the complications of disease, inability to meet the transportation charges to visit the clinics and distant primary health care centers¹⁹.

Factors Modifying Diabetes Mellitus	Pt's who said Yes	Pt's who said No
Pts who frequently visit doctor	29.1%	70.9%
Pts who feel better after treatment	74.5%	25.5%
Pts who are satisfied with information provided by physician	56%	44%
Pts who experience side-effects other than told by physician	42.7%	57.3%
Pts who are discouraged by health problems	54.5%	45.5%
Pts who are fearful about their future health	64.5%	35.5%
Pts who pursue restrictions in eating and lifestyle	75.5%	24.5%
Pts whose family and friends motivate towards life	79.1%	20.9%

Table-II. Patient-Physician interaction and society attitude towards Patients

56% patients in our study were satisfied with information provided by physician regarding pharmacological interventions and lifestyle interventions, which intend to reduce obesity by following a proper diet plan and increased physical activity, brings about considerable improvements in patient's quality of life. In 2000, an estimated 171 million people in the world had diabetes, and the numbers are projected to double by 2030²⁰.

In current investigation 42.7% patients stated the incidence of adverse events other than those told by physician due to non adherence to the therapy, recommendations and self-care and also other factors such as vascular and non vascular complications, depression, poor socioeconomic condition and pertinent adverse health traits like alcohol intake, smoking²¹.

In present report, 54.5% patients were depressed about their health problems such as burden of social and personal distress accompanied by diabetes. These not only influence the patients' ability to stick to the remedy but also their psychosocial welfare. Other factors that may complicate the self-care obligatory for diabetic patients include signs of emotional, cognitive, behavioral and social problems²². Whereas 64.5% diabetic patients were scared about disease condition because of development of traumatic complications like diabetic nephropathy, retinopathy, neuropathy and diabetic foot.

75.5% diabetic participants of our survey pursue to restrict dietary and lifestyle modifications. In addition to pharmacological interventions, lifestyle modification through yoga results in considerable physiological changes that can make substantial contribution to management of diabetes. Yoga is effective for controlling the symptoms and complications of diabetes as comprehensive yogic breathing schedule has been revealed to improve physical, social psychological behaviors and quality of life in diabetic patients concomitantly taking oral hypoglycemic²³.

Dietary interventions such as eating diets rich in cereal fibers, polyunsaturated fats and low in saturated, trans fats and glycemic load and other factors like regular exercise, smoking cessation and moderate alcohol consumption lowers the incidence of diabetes mellitus²⁴.

Family therapy plays an important role in improving the health of the patients and in our study 79.1% diabetic patients were motivated by their family and friends towards life because without family support and financial restrictions, it

become difficult for patients to frequently visit the clinics, monitor their blood glucose level and take their daily dose of insulin¹⁹.

Family rehabilitation aims at reducing diabetes-related conflicts among family members and decreases the impact of mental health disorders and stress related with diabetes, particularly in children and adolescents²⁵.

Demographic factors modifying diabetes mellitus are discussed below as shown in Fig.1. Gender inequity regarding healthcare, including diabetes, is observed worldwide and in our study male to female diabetic ratio remained 61:49 which is in consistence with another Indian study where higher diabetic ratio was recorded in men than in women. But unfortunately it is a bitter reality that most of the women are more prone to diabetic complications due to perceived social stigma thus failure to visit the physician for follow up. Owing to greater economic dependence on family members and functional limitations, women show poorer adherence to treatment²⁶.

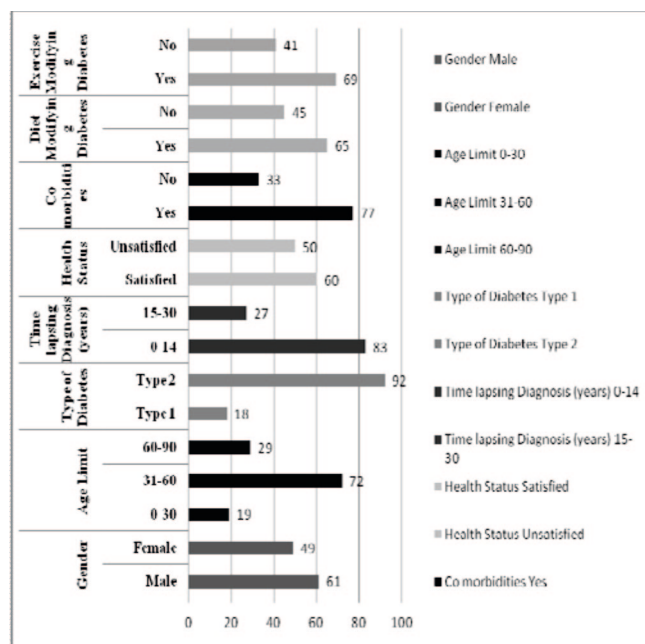


Fig-1. Demographic Factors Modifying Diabetes Mellitus

In our survey broad age bands were selected to assess the prevalence of diabetes mellitus among which majority of the patients lie between

30-60 years of age, which propose a biologically incredible increase in diabetes prevalence with increasing age²⁷.

The prevalence of diabetes had been estimated to be about 6.4% worldwide, and in the past two decades alone there has been a remarkable increase in the diagnosis of type 2 diabetes². The underlying reason for increased incidence of Type 2 diabetes mellitus in our community may be due to increased intake of Trans fat²⁷ and higher glycemic load. Therefore in our survey 92 patients were suffering from Type 2 diabetes mellitus²⁸.

Co morbidities in diabetic patients are linked with significant outcome for health care and economical status and due to poor socioeconomic conditions and higher illiteracy rate in Sargodha, 77 diabetic patients were having many other concurrent diseases. Co morbidities have been coupled with exaggerated health care utilization and enhanced medical care expenditures for diabetic patients. Co morbidities associated with diabetes mellitus include the following distressing conditions: heart diseases, retinopathy, neuropathy, nephropathy and diabetic foot. Furthermore, not only the patients with diabetes are increasing, but also the number of diabetic patients with co morbidities which infer that the existing single disease management strategy is not applicable to a large diabetic population in the future²⁹.

65 patients in the current study revealed that diet played a crucial role in modifying diabetes. Risk of Type 2 diabetes mellitus (T2DM) increases by high caloric intake thus increasing body weight and decreasing insulin sensitivity. Whereas insulin resistance is amplified by taking more carbohydrates rich in fructose and this in turn may increase the risk of T2DM. The protective role of dietary items i.e., whole-grain rich foods, dietary fibers, legumes, and green leafy vegetables against diabetes mellitus is due to their nutritional composition which may decrease the risk of diabetes by decreasing inflammation, enhancing glucose metabolism and insulin sensitivity²⁹.

The results of our investigation illustrate that 69

patients were well aware about the significance of exercise in diabetes management. Even though in our society exercise has little cultural meaning and exercise is observed as potentially worsening illness but religious Muslim prayers (namaz) are cited as a commendable and healthy exercise. As it is scientifically proven that exercise reduces HbA1c level and body weight which in turn diminishes the development of diabetes associated risk factors³⁰.

CONCLUSIONS

The need of present era for improvement in health care system is guiding the individuals with chronic illnesses like diabetes. The diabetic patients must be informed about importance of regular follow-up in averting long-standing complications. Patients should be guided about importance of dietary recommendations, exercise and strict metabolic control, that can holdup or avert the series of complications allied with diabetes. The aim of diabetic therapy is ample glycemic control and limitation of complications.

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