

## COMPARISON OF DIABETES MELLITUS TYPE II BETWEEN MALE AND FEMALE PATIENTS OF CIVIL HOSPITAL KHAIRPUR MIR'S SINDH PAKISTAN

SHAISTA GHUMRO, SAPNA WAHEED, KHADIM HUSSAIN MEMON\*

Department of Zoology, Shah Abdul Latif University Khairpur Mir's, Sindh, Pakistan.

### ARTICLE INFORMATION

**Article History:**

Received: 21<sup>st</sup> July 2023

Accepted: 04<sup>th</sup> December 2024

Published online: 25<sup>th</sup> December 2024

**Author Contributions:**

All authors contributed equally

**Key words:**

Diabetes type I, II, insulin, oral drugs, glucose level, dysuria, obesity. Prevalence

**Similarity Index:** 16%

### ABSTRACT

The goal of present study was to evaluate the prevalence of Diabetes type II in Civil Hospital Khairpur Mir's, Sindh, Pakistan. The primary data was assembled from September 2023 to November 2023 through the hospital survey and secondary data based on hospital record was collected from January 2022 to November 2023. The patients were categorized into different age groups of 30 to 40, 41 to 50 and 51 to 60 years. The blood samples were collected from a total of 90 subjects randomly meantime the interviews related to age group, gender (sex), obesity (overweightness), exercise, diet, family history and monthly income were also conducted from the same subjects. Out of 90 subjects male and female 70 individuals were selected with diabetes while 20 non-diabetic individuals were selected. According to obtained results the ratio of type II diabetes in male patients was observed as (44.4%) and the ratio of female patients was (55.6%). About (32.0%) were found with an age of 30-40 years, 30.0% was calculated with an age of 41-50 years and (38.0%) was observed with an age of 51-60years. It was observed that about (17.8%) patients were with Primary education, (6.7%) with Middle Education, (10.0%) with Secondary Education, (8.9%) with Graduation and (56.7%) was observed uneducated. The results of monthly income showed that (54.4%) suspects have less than 10000 monthly incomes, (14.4%) have 11000-20000 monthly income, (13.3%) have 21000-30000 monthly income, (5.6%) have 31000-40000 monthly income and (12.2%) have a monthly income of more than 41000. About (40.0%) patients were observed with a physical activity for one hour daily, (15.6%) with two hours daily, (5.6%) with three hours daily and (38.9%) patients were observed with no physical activity. However, the obtained results of  $p > 0.05$  for age and diabetes showed the non-significance association between age and diabetes, The education and monthly income showed the non-significant association  $p > 0.05$  with diabetes while physical activity showed the statistically significant association  $p < 0.05$  with diabetes. Meantime the symptoms such as too much hunger and blurry vision show statistically significant association  $p < 0.05$  with diabetes. Since the results of secondary data of year 2022 showed that maximum ratio of male diabetic patients was observed as (9.2%) in the month of December and minimum ratio of male patients (7.0%) was observed in the month of February. While the maximum ratio of female patients (9.3%) was observed in the month of January and the minimum ratio of female diabetic patients (7.0%) was observed in April. Meantime the calculated results for the year 2023 showed that the maximal percentage of male subjects (10.6%) was examined in the month of January and least proportion of male patients (8.9%) was examined in the month of February. While the maximum ratio of female patients (10.5%) was observed in the month of October and the minimum ratio of female diabetic patients (9.4%) was observed in the month of February in Civil Hospital Khairpur, Sindh, Pakistan.

\*Corresponding Author: [khaidm.memon@salu.edu.pk](mailto:khaidm.memon@salu.edu.pk)

Copyright 2017 University of Sindh Journal of Animal Sciences

## 1. INTRODUCTION

Diabetes mellitus (DM) is a disease in which the body has inability to make and use insulin. Insulin is a hormone which is generated by the pancreas that regulates the blood sugar levels in the body which supports the transfer of glucose from blood to the corpuscle of the body, where it is hydrolyzed and used for energy purposes. Without insulin people cannot survive because they can't maintain the blood glucose level in the body (ADA, 2007). Diabetics results in abnormal glucose levels in the bloodstream. A person could lead to serious short and long repercussions such as brain damage, amputations and also heart disease (ADA, 2007). DM considered a common diverse disorder of metabolism in which a subject face with chronic hyperglycemia. The reason of Diabetes is either lessened insulin secretion or impaired insulin actions or both (Kerner and Brückel, 2014). DM is acute fundamental metabolic disease, which not only extremely damage human health, but cause a huge socioeconomic problem (Wang et al., 2013; Ajami et al., 2006-2009). According to the modernized information from the international diabetes federation (IDF), expected global frequency of DM achieved 8.8% in 2015 and 12% of worldwide health outflow was due to DM in same year (Yates and Khunti, 2016).

Diabetes mellitus is rising as an epidemic of the 21st century. About 366 million people around the world have diabetes and it is probable to increase to 552million by 2030 in which midmost-income countries where more than 80% of diabetes death happened. Biologically male and female have similar diabetes popularity (International Diabetes Federation). Diabetic type I considered only for sectional of whole burden of diabetes in the age of earlier and found maximal in the well-to-do countries and grow equally in the rich and poor countries in globe. Additionally, a swing concerning to type I diabetes occurs in children at earlier age (Sicree et al., 2006). About 85 to 95% of diabetes type II are calculated as higher dominance range in most of advanced countries. It is thoroughly associated with inappropriate consumption of insulin by target cell and tissues. A presently extensive and severe health distress globally. According to WHO (1994), current cultural as well as social trends such as ageing population, growing urbanization, dietary changes, decreasing physical activity and undesirable life and behavioral patterns have aggravated these problems. Diabetes mellitus and milder types of glucose intolerance are primary impaired glucose tolerance and may now be found in almost every population on the planet and epidemiology information suggest that

without effective prevention and control program diabetes will likely continue to rise globally (WHO, 1994). In 2010 it was estimated that 285 million people aged 20 to 70 years ahead of having diabetes in worldwide levels, with 70% of them living in developing countries. By 2030, this figure is expected to rise to almost 438 million. In addition, the number of persons with IGT is predicted to rise to 472 million accounting for 8.4% of the adult population (Sicree et al., 2006). Various organ failure as well as growing metabolic disorders such as retinopathy, nephropathy, and neuropathy are among the unbearable symptoms of diabetes (Piero, 2006). One of the most frequent non-communicable diseases in the world is diabetes (Shaw et al., 2010).

Insulin is an anabolic hormone and the most successful glucose lowering agent existing. It is suggested for usage in T1DM as sole remedy and in T2DM patients weakening to control sugar levels with oral hypoglycemic drugs (Michael, 2012). As concern with metabolism of proteins, insulin developed for the transport of amino acid across membrane, trigger the protein formation, and prevent proteolysis. Integration of fatty acid from rotating triglycerides into adipose triglyceride as well as lipid formation is triggered by insulin lipolysis is introverted. Insulin participates to nucleic acid formation by stimulate the synthesise of DNA, ATP, and RNA (Cahill, 1971). Insulin has anabolic action and insulin signaling is dangerous for developing uptake, use and storage of main nutrients such as glucose, lipids, and amino acids. Insulin provokes glycogenesis, lipogenesis, and protein formation (Ahmed, 2002). Several factors affecting lifestyle which are important to be known for the development of type II DM. These factors are physical inactivity, sedentary lifestyle, cigarette smoking, obesity, hypertension, elevated cholesterol (combined hyperlipidemia), generous consumption of alcohol, stress, dehydration habits, too much hungry and genetically disorders (Hu et al., 2001). There are strong inheritable genetic connection in type II DM as having relative (especially first degree) with type II DM increases the risk of developing type II DM substantially (Rother, 2007).

## 2. MATERIALS AND METHODS

### 2.1 Samples Collection

A cross-sectional study was conducted for the analysis of blood sugar level in male and female diabetic and non-diabetic patients. This study was conduct in Civil hospital Khairpur Mir's, Sindh Pakistan. A total of 90 blood samples were collected from diabetic type 2 and non-diabetic patients. Out of 90 subjects 70 were diabetic and 20 were non-diabetic. Before collection

of blood sample each individual was informed regarding the purpose of sampling. The blood sample was collected with the help of a medical technician.

### **2.2 Analysis of samples in laboratory**

These groups were further divided into three different age groups of (30-40), (41-50) and (51-60) years. The random blood sugar levels measured either in emergency conditions using gluco-meter or samples were sent to laboratory for analysis. Where samples were analyzed using micro lab 300 machine. In the laboratory the end point pip method was used for reading blood sugar level. The 3cc blood sample from the patient through the syringe was collected. After that the blood sample was transferred into Eppendorf tube. The sample was left at room temperature for 10 to 12 minutes for clotting of blood. After that the sample was centrifuged using centrifuge machine at about 4000 rpm (revolution per minute) for 2-5 minute for separation of serum. 10ul serum was taken in a separate Eppendorf tube and 1 ml of glucose reagent (1000ul) was added with the help of macro tips attached with the pipette of (100-1000ul) and the sample was kept for incubation at 37°C for 10 minutes. Before analysis the Micro lab was rinsed to prevent it from contamination and was set at Zero using water (blank). After that the sample was analyzed using Micro lab 300 of MERCK Company, the glucose testing was selected in the Micro lab and reading was noted.

### **2.3 Statistical Analysis**

After the tabulations of information, the data analyzed by using the SPSS software sheets (IBM\* SPSS statistics version 21). To know the total prevalence of diabetic patients with type 2 populations selected from Civil hospital Khairpur Sindh Pakistan. The data of total patients of diabetes males and females were collected from January 2022 to November 2023. For keeping records of data, a questionnaire applied having the information including (patients name, husband or father name, address, age, history of diabetes, test result of randomly blood sugar levels, smoking, cardiac patients, weight, diet, blood pressure, sign, and symptoms of patients etc.

## **3. RESULTS AND DISCUSSION**

The present study was to evaluate the Comparison of diabetes type II between male and female in the civil hospital Khairpur Mir's Sindh. About Ninety patients were selected randomly for the diabetic tests from September to November 2023. The age of subjects varied from 30 to 40, 41 to 50, 51 to 60 years old. According to present results the percentage of males

and female's patients were observed to be 44.4% and 55.6% respectively, as shown in table 1.

We have differentiated the patients based on physical activities (exercise) in the daily routine of their life. According to our study we observed the 40.0% patients were doing exercise one hour, 15.6% were doing exercise two hours, 5.6% were doing exercise three hours, and 38.9% did not have any physical activities as represented in table 2.

During the research work we observed the effect of family history on the patients. According to our survey we concluded that the 54.4% subjects have diabetes, due to their family history because as we know there are some diseases are found in the grandfather or grandmother which transfer to their next generation, so diabetes is also one of the heritable diseases that cause some of serious effect on life of organism. As diabetes is the autosomal dominant mutation they can passed on to children when only one parent carries the gene for the disease, in this case mostly the parent who carry the gene has 50% chances to transfer it to their offspring. While 45.6% did not have consequences for transferring of disease because they are non-diabetic as signify in the table 2.

In our study, most diabetic patients were found to have frequent urination they cannot control the urine because they lose their control due to hyperglycemia. About 67.8% have dysuria that is abnormally frequent urination once or more than that in every hour, although 32.2% have not any dysuria because they have normal body glucose level, and they were performing normal urination as presented in the table 4.

In our study we examine the Patients that have distributed on the core of medication such as Glucophage, metformin, Glipizide tablets, and insulin injections. About 37.8% patients use the injection of insulin mostly in the case of type I diabetes but some time it is also injected in type II diabetes, while 40.0% were taking the medicines and has generally been used by type II diabetic patients as depend upon their condition and range of sugar level mostly, they used Glucophage tablets. These tablets play an important role in preventing organism from kidney damage, nerve problems, loss of limbs and sexual function problems. While it is also dependent upon the patients which type of diabetes, they have either type I or type II Diabetes. Others 22.2% were normal glucose levels because they were non-diabetic patients as shown in the table 3.

In the Civil hospital Khairpur, we found that 51.1% patients were having blurry vision due to diabetes that

cause the swelling in the eyes, temporary change in the vision but sometimes it damaged the back of the eye (retina) which cause blindness. A drug Metformin which has the effect of lowering the sugar level helped people lower the chances of developing vision loss. While 48.9% were normal eye vision as shown in table 6.

In this study it is observed that the diabetic subjects have different complications such as fatigue, frequent urination, hyperglycemia, thirst, too much hunger, stress, hypertension, physical activity, blurry vision, diet plan irregularity and various other factors that affect the lifespan of a patient, while non-diabetic patients involved in normal life, they do not have any complications.

To our knowledge, Diabetes mellitus is an endless disease in developing countries. In different provinces of Pakistan, a lot of work had been done in different aspects of diabetes mellitus. According to our study first one is to compare the prevalence of type II Diabetes mellitus between males and females. The overall prevalence of the study was found to be 26.1% in both males and females in three village of Khyber Pakhtunkhwa (Shera et al., 2007) and other provinces such as in Sindh 25% of prevalence (Shera et al., 1995), while in Baluchistan 22% (Shera et al., 1999). The maximum figures of abnormal glucose tolerance were found as 25.1% in men and 26.4% in women with the growing age, the prevalence of T2DM in Pakistan was recommended an increase from 4.3 million in 1995 to 14.5 million in 2025 as expected. This will include the Pakistan the fourth among top 10 diabetes reporting countries of the world (Wild 2004). Diabetes mellitus is attributable to many factors such as industrialization, urbanization, and a change in lifestyle (Ramachandran et al., 2003).

However, our present work was conducted in Civil Hospital Khairpur Mir's Sindh Pakistan. The results in this study showed the comparison of diabetes type II between male and female. We conducted our survey from September to November 2023. The current study shows the prevalence of diabetes type I and type II in gender, males as 44.4% and in females 55.5% in Civil Hospital Khairpur Mir's. While previous observation explained that the total 15.41% of males and 12.31% of females were found with diabetes (Zafar et al., 2011). Thus, the present ratio is increasing due to environmental factors affecting the sedentary lifestyle. The current study shows age wise comparison of diabetes mellitus type II was higher in the age group of 45-60 years as 44.3% and lower in age group of 30-40 years that was 9.9%. As observed in the previous literature age group was higher in 55-64 years that

denoted the same results in our study (Ahmed et al., 2011).

Our result showed that the Net monthly income of 54.4% of patients had less than 10,000 rupees, 14.4% had 11000-20000 rupees, while as 13.3% had 21000-30000 rupees, 5.6% had 31000-40000 rupees and 12.2% had more than 41000 rupees. In previous work shown 36.2% had less than 10000 rupees (Hydier et al., 2004). This increasing ratio indicates the poorness of people and unawareness about diabetes. The current work demonstrates that 54.4% of patients had diabetes due to inheritance, while 45.6% had not family history effect but they have developed diabetes due to environmental factors such as obesity, stress, imbalanced diet, and others. According to the association between family history with diabetes we found non-significant  $p=0.651$  due to  $p>0.05$ . While previous work described the family history and hypertension, obesity and sedentary lifestyle were strongly associated with the presence of disease ( $p<0.05$ ) as followed ( $p=0.002$ ). (Khan et al., 2013). The current study shown the maximum values of random blood sugar levels reached between 280mg/dl and 300mg/dl in most of patients due to increasing blood pressure and less physically activity as significant  $p<0.05$  ( $p=0.000$ ). In previous work maximum number of patients 51% out of 100% had diabetes due to obesity, smoking, trauma to pancreas, physical sluggishness (Zuhaid, 2012).

#### 4. CONCLUSION

The present study concludes that there was a significant association between physical activity and diabetes, while there was no significant association between monthly income and diabetes. While there was a significant association between marital status and diabetes. Meantime, the symptoms such as too much hunger, blurry vision and frequent urination showed statistically significant association with diabetes. However, the observed results of secondary data showed that there was an increased trend of diabetic patients from 2022-2023 in Civil Hospital District Khairpur Mir's, Sindh, Pakistan.

#### 5. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interests regarding the publication of this article.

#### REFERENCES

Ahmad SR, Ahmed M, Haider I, Turabi A, Khan FA (2011) Prevalence of diabetes mellitus in

- adult population of Rawalpindi. *Pakistan journal medical science* :5(3).
- Ahmed AM, (2000) History of diabetes mellitus. *Journal Saudi Medical*.Apr;23(4):373- 378.
- Ajami, D., M.L.; Wu, J.; Fink, J.C(2014), Differences in health services utilization and costs between antihypertensive medication users versus nonusers in adults with diabetes and concomitant hypertension from Medical Expenditure Panel Survey pooled years 2006 to 2009. *Value Health*, 17, 51–61.
- Akhtar, S., Khan, Z., Rafiq, M., & Khan, A. (2016). Prevalence of type II diabetes in District Dir Lower in Pakistan. *Pakistan journal of medical sciences*, 32(3), 622.
- American Diabetes Association (2007). Diagnosis and classification of Diabetes mellitus. *Diabetes care*.30 suppl.1: S42-7.
- American Diabetes Association (2007). Standards of medical care in diabetes. *Diabetes care Journal* .30 suppl.1: S4-S41.
- Badaruddin, AM., Khalid, B., (2002). Prevalence of diabetes mellitus in sukkur region. *Pakistan Journal Medical Sciences Res*.41 (1) :19-22.
- Cahill Jr, G. F. (1971). Physiology of insulin in man: *the Banting Memorial Lecture 1971*. *Diabetes*, 20(12), 785-799.
- Hu, F. B., Van Dam, R. M., & Liu, S. (2001). Diet and risk of type II diabetes: the role of types of fat and carbohydrate. *Diabetologia*, 44(7), 805-817.
- Hydrie MZI, Basit A, Badruddin N and Ahmedani MY (2004) Diabetes Risk Factors in Middle Income Pakistani School Children *Pakistan Journal of Nutrition* 3 (1): 43-49.
- Khan S, Abbas M, Habib F, Khatak IH and Iqbal N (2013) Prevalence of Diabetes mellitus in Mirpur and Kotli districts of Azad Jammu and Kashmir (*AJ & K Sarhad Journal of Agriculture*: 23(4).
- Kishimoto, M., Tamad, S., Oshiba, Y., (2017). Successful glycemic control using a flesh glucose monitoring system for a pregnant women diabetes. *Journal of diabetes and metabolic disorder* ,16:44.
- Michael, A. P., Nguyen, Q. T., Sanders, L., Anderson, S. R., Nguyen, L. D., & Johnson, Z. A. (2012). Diabetes medications and cancer risk: review of the literature. *American health & drug benefits*, 5(4), 221.
- Nwaokoro. Joakin Chidozie . Ede Alison Okorie . Emerole Chima . Ibe Sally. Amadi,I.N.S. Dozie Lwuji. Nwaokoro. (2014). Study on the effect of smoking on type 2 diabetic patients in Federal *Medical Center Owerri. Southeastern Nigeria*. 3(5) :63-71.
- Piero, M. N., Nzaro, G. M., & Njagi, J. M. (2015). Diabetes mellitus-a devastating metabolic disorder. *Asian journal of biomedical and pharmaceutical sciences*, 5(40), 1.
- Ramachandran A., Snehalatha C., Viswanathan (2003) Explosion of Type 2 diabetes in the Indian Subcontinent Int. *Diabetes Monitor journal* ;15:1–6.
- Rother, K. I. (2007). Diabetes treatment—bridging the divide. *The New England journal of medicine*, 356(15), 1499.
- Shaw, J. E., Sicree, R. A., & Zimmet, P. Z. (2010). Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes research and clinical practice*, 87(1), 4-14.
- Shera A, Rafique G, Ahmed K, Baqai S, Khan I, King H (2007) Pakistan National Diabetes Survey prevalence of glucose intolerance and associated factors in Northwest Frontier Province (NWFP) of Pakistan. *Journal of Pak Med Association*. 49(9):
- Shera A., Rafique G., Khawaja I., Baqai S., King H., (1999) Pakistan National Diabetes Survey: prevalence of glucose intolerance and associated factors in Baluchistan province. *Diabetes Res Clin Pract*.:44(1):49-58.
- Shera AS., Rafique G., Khwaja IA., Ara J., Baqai S., King H., (1995). Pakistan National Diabetes Survey: Prevalence of Glucose Intolerance and associated factors in Shikarpur. Sindh province. *Diabetic Medical journal* :12(12):1116-1121.
- Siren, R., Eriksson, J. G., Peltonen, M., & Vanhanen, H. (2014). Impact of health counselling on cardiovascular disease risk in middle aged

men: influence of socioeconomic status. *PLoS One*, 9(2) WHO. Cowie, C. C., Rust, K. F., Ford, E. S., Eberhardt, M. S., Byrd-Holt, D. D., Li, C., Geiss, L. S. (2009). Full accounting of diabetes and pre-diabetes in the US population in 1988–1994 and 2005–2006. *Diabetes care journal*, 32(2), 287-294.).

Wang, L., Gao, P., Zhang, M., Huang, Z., Zhang, D., Deng, Q., Wang, L. (2017). Prevalence and ethnic pattern of diabetes and prediabetes in China in 2013. *Jama*, 317(24), 2515-2523.

Wild S., Roglic G., Green A., Sicree R., King H., (2004) Global prevalence of diabetes. *Estimates for Diabetes Care*.:27:1047–1053.

Yang, w., Lu, J., Weng,J., Jia , W., Ji, I., Xiao, J.,(2010). Prevalence of diabetes among men and women in China. *England Journal Medical* 362(12) :1090-1101.

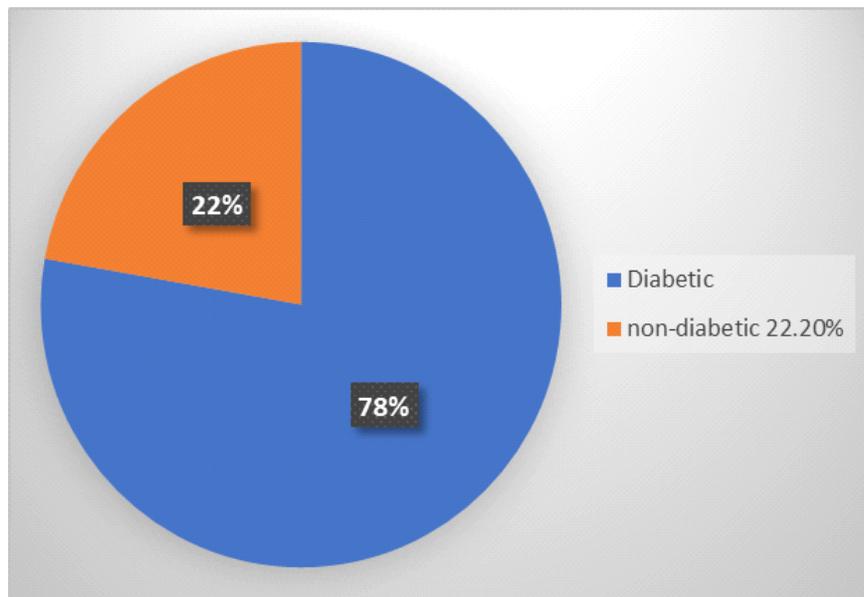
Yates, T., & Khunti, K. (2016). The diabetes mellitus tsunami: worse than the 'Spanish flu'pandemic? *Nature Reviews Endocrinology*, 12(7), 377-378.

Zafar J, Bhatti F, Akhtar N, Rasheed U, Bashir R, Humayun S, Waheed A, Younus F, Umaima MN (2011). Prevalence and risk factors for diabetes mellitus in a selected urban population of a city in Punjab: 61(1).

Zuhaid M, Zahir KK, InayatUllahDiju (2012) Knowledge and perceptions of diabetes in urban and semi urban population of peshawar, *Pakistan Journal Ayub Medical College Abbottabad*; 24(1).

**Table 1. Frequencies and percentage of male and female subjects from civil hospital Khairpur Mir’s Sindh, Pakistan.**

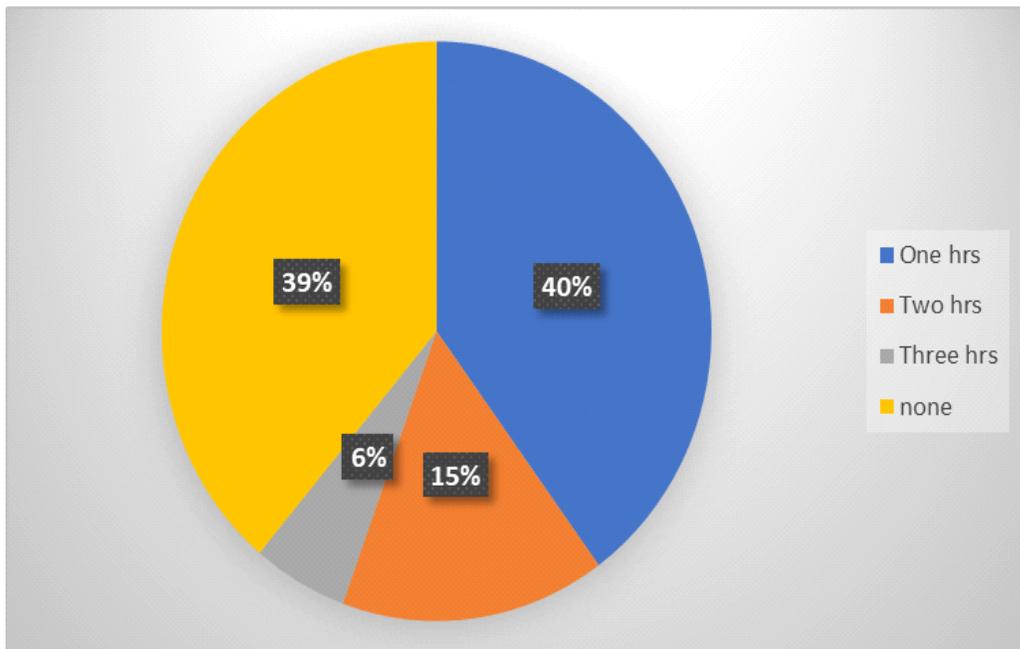
Gender	Frequency	Percentage
Male	40	44.4%
Female	50	55.6%
Total	90	100%



**Figure 1. Percentage of male and female subjects from civil hospital Khairpur Mir’s Sindh, Pakistan shown that 78% subjects with diabetic while 22% were non-diabetics.**

**Table 2. Frequency and Percentage of subjects associated with Physical activity in Civil Hospital Khairpur Mir’s Sindh Pakistan.**

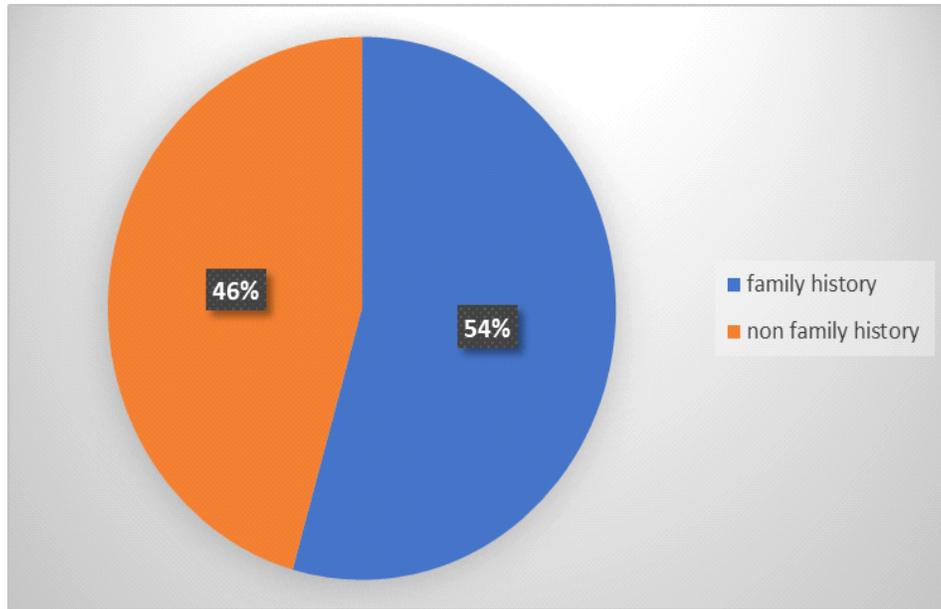
Physical activities per hours	Frequency	Percentage
One hour	36	40.0%
Two hours	14	15.6%
Three hours	5	5.6%
No activity	35	38.9%
Total	90	100%



**Figure 2. Percentage of physical activity in subjects from civil hospital Khairpur Mir’s Sindh, Pakistan.**

**Table 3. Shows high percentage of patients with diabetes rather than non-diabetic patients because of the genealogy arrangements.**

Family history of subjects	Frequency	Percentage
Diabetic	49	54.4%
Nondiabetic	41	45.6%
Total	90	100%



**Figure 3. Percentage of family history concern with diabetic and non-diabetic patients in the Civil Hospital Khairpur, Mir’s Sindh, Pakistan.**

**Table 4. The frequency and percentages of patient having dysuria in the Civil Hospital, Khairpur Mir’s Sindh, Pakistan.**

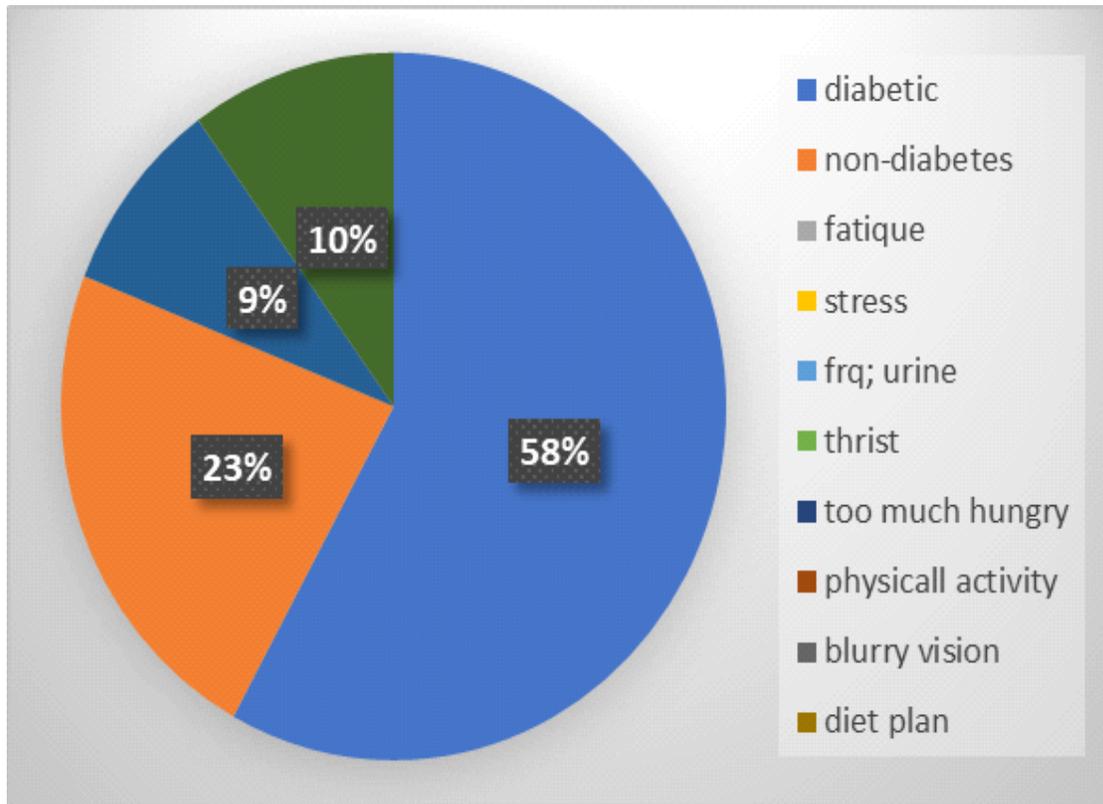
Frequent urinations	Frequency	Percentages
Dysuria	61	67.8%
Normal	29	32.2%
Total	90	100%

**Table 5. Shown the frequency of patients and percentages that were elaborate the medication during observation.**

Medication of patients	Frequency	Percentage
insulin	34	37.8%
Medicines	36	40.0%
Non diabetics	20	22.2%
Total	90	100.0%

**Table 6. Frequency and Percentage of patients compare between blurry vision and normal in Civil Hospital Khairpur Mir's Sindh Pakistan.**

Blurry Vision	Frequency	Percentages
Abnormal	46	51.1%
Normal	44	48.9%
Total	90	100%



**Figure 4. The whole Percentages of symptoms concern with Diabetic and Non-Diabetic subjects in the Civil Hospital Khairpur Mir's Sindh, Pakistan.**