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FREQUENCY OF DEPRESSION IN DIABETIC PATIENTS VISITING TEACHING HOSPITAL

Dr. Firasat Ullah Shah[*1], Dr. Ghulam Ullah[2]

[*1]*Post Graduate, FCPS Internal Medicine, Civil Hospital Quetta*
[2]*Post Graduate, FCPS Internal Medicine, BMCH Hospital Quetta*

Corresponding Author: *

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ABSTRACT

In 2015, the International Diabetes Federation (IDF) reported that out of each 11 adults, one adult worldwide, or more than 0.415 billion people aged 20 years to 79 years, had been diagnosed with diabetes mellitus. The existence of type 2 diabetes mellitus and its associated outcomes have had a significant impact on death rates and disability rates worldwide. A complicated illness, depression is characterized by feelings of hopelessness, boredom, powerlessness, and diminished interest in once-enjoyable activities. It also involves decreased energy, a lack of zeal, dissatisfaction, and optimism. In both industrialized and developing nations, diabetes and depression are common illnesses. Research has indicated a correlation between depression and a greater risk of increasing diabetes. Likewise, there is a little increase in the likelihood of experiencing depressive symptoms if you have diabetes.

Researchers in Quetta set out to determine how often depressive symptoms were experienced by diabetes patients who sought treatment at a teaching hospital. The study was conducted in the outpatient department of the medical department of Sandeman Provincial Hospital in Quetta, using cross-sectional data. There were 113 patients in this research study. Regardless of gender, every participant in the trial had to be over thirty and have been diagnosed with type II diabetes mellitus not less than five years. The study did not include participants who were receiving medication for any mental illness. Individuals with long-term illnesses such as cancer, rheumatoid arthritis, osteoporosis, chronic liver disease as well as kidney disease were not included. Insulin-dependent individuals and those who declined to participate were among the reasons for exclusion. The SPSS version 23 application was used to enter and evaluate the data. The study participants were apportioned into the following categories according to their gender: Of the total population, 53.1% were females (60 individuals), and 46.9% were males (53 individuals). The standard deviation of the 52.08-year mean age was found to be 9.30 years. The normal length of the sickness was 6.43 years, with an std dev (SD) of 2.88 years, and the duration range was 2 to 15 years. Our study's findings demonstrated that 77 patients, or 68.1%, had a nervousness diagnosis and a HADS nervousness score of more than 10. This implies that a significant number of patients suffer from anxiety. However, the HADS scale showed that 14 individuals, or 31% of the participants, showed symptoms of depression. Individuals diagnosed with diabetes who are admitted to a Quetta Teaching Hospital had a thirty-one percent chance of developing depression before leaving the hospital. We concluded that depression in diabetic patients is increasing to an alarming situation. It will affect the health of patients more than only diabetes mellitus type 2.

INTRODUCTION

People who have long-term medical conditions may become agitated and difficult to control. Sustaining health during the course of chronic illnesses requires consistent effort. To discuss their issues, patients frequently visit their physicians for consultations. The World Health Organization (WHO) projects that by 2025, 300 million individuals worldwide will have diabetes. In Pakistan's cities, the commonness of diabetes mellitus was 3.5% in the female population and 6% in the male population, and for rural areas, the incidence was 2.5% among women and 6.5% among men (1).

Diabetes gradually impairs almost all of the physiological systems. Retinal impairment, nephropathy, diabetic peripheral neuropathy, and myopathy are typical symptoms. Patients with diabetes are likely to experience these problems under the circumstances when they do not follow their doctor's prescription and modify their lifestyle (2).

Depression makes people with diabetes feel worse about their health and more stressed out in social situations. According to one study (3), glucose levels were more significant in depressed patients both before and after meals. Depression and nervousness have detrimental effects on chronic illnesses, including diabetes. These effects include not following dietary and medication regimens, taking medicines at the wrong time, taking too much or too little, and being less able to handle physical activity (4). By examining the commonness of depression among diabetes patients at a teaching hospital in Quetta, this study aims to enlighten medical professionals. The patient's symptoms will be better treated if a psychiatric illness is identified.

Operational definitions:

Patients with type II diabetes who have been on anti-diabetic medicine for at least five years are considered in the scope of this study. Individuals with type I diabetes and those who need insulin for their diabetes will not be accepted. A frequent mental health condition called depression is characterized by a lingering sense of melancholy and a decreased desire to engage in activities. Measurement will be done using the Hospital Anxiety and Depression Scale (HADS). Stress is the natural physiological reaction to anxiety, and it often acts as the leading cause of worry—nervousness or fear stemming from anticipated future occurrences. In order to measure depression, a reliable self-assessment tool is the Hospital Anxiety and Depression Scale (HADS). It has been used for 34 years and is regarded as a reliable tool. Additionally, a Proforma is attached to this report for your review. There are two subscales in the assessment: one for depression and one for anxiety. Each subscale has seven items. The cut-off point will be determined using a score of nine. Patients who receive a score of nine or higher will be sent to a licensed psychiatrist for additional evaluation and psychotherapy since they are deemed to have depression.

Literature Review

Diabetes Mellitus

Epidemiology

Complications from diabetes mellitus are becoming more common, and it poses a serious risk to public health everywhere. Based on the data from the International Diabetes Federation (IDF), 1 in 11 persons between the ages of 20 and 79, or 0.415 billion people worldwide, were diagnosed with diabetes mellitus in 2015 (25). The population is expected to boost to 642 million by 2040, with the most significant growth occurring in regions where the economy is transforming from low-income to middle-income. However, it is possible that these figures may not fully capture the international effects of diabetes mellitus, particularly in regions where the condition is changing quickly (26).

Global burden of T2DM

The rate of Type II diabetes mellitus (T2DM) and its aftereffects have a significant impact on death and morbidity rates around the world. According to the 2013 International Burden of Disease Study, diabetes mellitus is in whole form. It is shown to be the ninth most significant factor in lowering life expectancy. In 1990, a high fasting glucose level was found to be the tenth most prevalent international risk factor for disability-adjusted life years (DALYs), according to the Global Burden of Diseases, Injuries, and Risk Factors Study 2015. It became the third most common risk factor by 2015, reaching the fourth position by 2005. It was responsible for 143 million DALYs in 2015, a 22% increase from 2005 (30). The frequency of diabetes mellitus grew fourfold worldwide between 1980 and

2014. According to a study, between 2010 and 2030, the prevalence of diabetes mellitus is expected to go up by 20% in developed countries and by 69% in under-developed countries (31). Asia is currently the main continent where Type II Diabetes Mellitus (T2DM) is spreading quickly. Just 25% of patients with diabetes mellitus had received treatment, and less than 40% of those who got treatment had blood levels of HbA1c. Less than 33% of people with diabetes mellitus had previously been determined. Prevalence rates range from 25% in several Polynesia and Micronesia islands to 30% in American Samoa. The worldwide diabetes mellitus pandemic has significantly impacted the Middle East. In this region, the commonness of diabetes mellitus varies from 9.5 percent in Oman to 25.4 percent in Saudi Arabia (32, 33). In sub-Saharan Africa, the IDF 2015 predicts that the prevalence of diabetes ranges from 2.1% to 6.7%, despite the absence of recent regional information.

Pathophysiology and Major Risk Factors

Irregular insulin secretion and activity feedback systems lead to abnormal blood glucose levels. It causes a commutation in insulin sensitivity (insulin resistance in type II diabetes mellitus) and a decrease in pancreatic islet β-cell insulin production (β-cell dysfunction in type II diabetes mellitus). Insulin is less effective in sensitive tissues, like the liver, muscle, and adipose tissue. Insulin resistance raises the quantity of glucose produced by the liver. It decreases the capacity of muscles and adipose tissue to absorb glucose at a particular insulin level, which promotes type II diabetes.

Furthermore, insufficient insulin release resulting from dysfunctional β-cells is inadequate to maintain ideal glucose levels. Two essential components of the early pathophysiology of Type II Diabetes Mellitus (T2DM) are β-cell malfunction and insulin resistance. For Pima Indians, these variables are crucial in the change from standard glucose tolerance to impaired glucose tolerance and, ultimately, type II diabetes.

Overweight and obesity

In most industrialized economies, like the United States of America (USA) (36), as well as developing nations like China, the commonness of type II diabetes is rising in tandem with rising obesity rates. It is happening at the same time. Early in the 1990s, Cuba had a sharp decline in the number of people having diabetes mellitus because of a general decrease in body weight among its citizens. The fact that the body weight of the entire population decreased led to this observation. A financial crisis was the root cause of this situation. At a given body mass index (BMI), Asian people usually have higher visceral adiposity and total body fat percentage than White people. People of Asian origin have higher BMIs than people from other geographical regions. Moreover, people of Asian heritage have a distinct tendency toward central or abdominal obesity, which is connected to a higher risk of type II diabetes. People of Asian heritage are particularly prone to this syndrome. There is considerable ethnic heterogeneity in the pathophysiology of type 2 diabetes, which can be explained by differences in the disease's clinical features and genetic composition. β-cell activity is generally lower in non-diabetic individuals of Asian background than in non-diabetic individuals of White descent. However, this approach is not only expensive, but it is also improbable that the current diabetes mellitus epidemic will be stopped successfully. Thus, the implementation of obesity prevention programs at the population level must be given top priority. Examining the underlying reasons that contribute to the increment of diabetes mellitus and obesity is crucial due to the reason to treat the coexisting epidemics of these diseases. Individuals' suboptimal choices about their food and lifestyle behaviors are a significant predictor (37, 38, 39).

Diet and Lifestyle Factors

Dietary and lifestyle changes are crucial for preventing type II diabetes mellitus (T2DM). According to scientific studies, those who significantly alter their lifestyles are 58% less likely than control groups to develop diabetes mellitus. Clinical research has shown that these treatments are more effective than pharmacological ones. It is challenging to analyze the long-term effects of interference because of participant apathy and the high costs of large-scale research. It's crucial to consider the outcomes of extensive observational studies with lengthy follow-up periods when evaluating treatment trials involving high-risk patients (40, 41). This all-encompassing method is necessary to assess the consequences for public health.

Diet

In this book, the main findings from studies examining the relationships between nutrients, food groups, dietary patterns, and the risk of generating type II diabetes mellitus (T2DM) are briefly summarized. To avert the onset of type II diabetes mellitus (T2DM), giving more weight to the quality of fats and carbs ingested than to their quantity is imperative. Following a diet high in polyunsaturated and low in trans fats is essential to preventing type II diabetes. Having foods with a low glycemic index and load is also necessary. As preventive dietary interventions for Type 2 Diabetes Mellitus (T2DM), diets rich in whole fruits, grains, vegetables, legumes, and nuts are continuously advocated. On the other hand, diets low in carbs, containing sugar-sweetened beverages, and containing red or processed meats are not encouraged. Following a nutritious diet, like the Mediterranean diet, has been significantly linked with a decreased incidence of type II diabetes (T2DM) (42, 43).

Physical activities

A key factor of lifestyle-based programs intended to prevent Type II Diabetes Mellitus (T2DM) is the inclusion of regular physical activity. According to a study, resistance training and aerobic exercise have distinct preventive impacts on Type II Diabetes Mellitus (T2DM). According to a study, longer durations of moderate- and high-intensity physical activity are more advantageous than sedentary lifestyles in reducing insulin resistance. Regardless of the duration of sedentary behavior, the same effect was found. On the other hand, a different study discovered that prolonged periods of inactivity, independent of an individual's level of physical activities, are linked with an increased risk of type II diabetes (44, 45).

Smoking

Compared to non-smokers, current smokers had a 45% higher risk of type II diabetes mellitus. There is a connection between the number of cigarettes smoked and the chance of getting type 2 diabetes, according to a meta-analysis. A longer duration of exposure to secondhand smoke has also been linked with an increased risk of type II diabetes. Smoking increases the risk of acquiring type 2 diabetes in addition to causing insulin resistance and the body to generate more insulin to compensate. Additionally, compared to non-smokers, smokers are more likely to accumulate central fat. Prioritizing public health programs targeted at quitting smoking is essential to addressing the epidemic of type II diabetes, particularly in nations like China and India, where the two conditions are prevalent (46, 47).

Alcohol intake

use of alcohol Moderate alcohol use has been linked with a lower risk of type II diabetes. Researchers found a U-shaped correlation between alcohol use and the incidence of type II diabetes in both males and females after doing a meta-analysis of twenty cohort research studies. Researchers found that people who drank one to two beers a day had the lowest chance of becoming diabetics during the trial. There could be differences in gender in the correlation between drinking alcohol and getting type II diabetes. It could be explained by differences in the pharmacokinetics of alcohol, which are impacted mainly by body composition (48, 49). There could be differences between genders in how they process and get rid of alcohol.

Genomics and Gene-Environment Interactions

While more cases of type 2 diabetes (T2DM) can be protected by maintaining a healthy weight and leading an active lifestyle, certain people with prediabetes mellitus are more likely than others to develop T2DM. It makes it clear that various people react differently to changes in their lifestyle. Research on twins and families provides strong evidence that type II diabetes is a hereditary condition. The complex polygenic features of type 2 diabetes have been highlighted by the discovery of over a hundred strong association signals in the last ten years of T2DM-related genome-wide association studies. Changes in vulnerability were found to be correlated with quantitative diabetic indicators in a 2014 study. Based on the possible directions these alterations could go in the creation of type II diabetes mellitus (T2DM), we categorized these changes. Nine variations were linked to normal fasting blood sugar levels and decreased insulin secretion. Two were related to fasting hyperglycemia and reduced insulin secretion; one variable was discovered to modify insulin processing. Four variations additionally displayed a distinct pattern of insulin resistance. Our data indicate that the genetic architecture of type II diabetes is highly polygenic. As a result, more significant correlational research is required to find most T2DM loci, which frequently show moderate to modest effect sizes (50, 51).

Biomarkers and metabolomics

Over the last two decades, indicators originating from abnormal signaling in adipose tissue, latent inflammation, abnormalities in vascular endothelial cells, and excessive iron levels in the body have supported our understanding of the intricate pathogenesis of type 2 diabetes. Our knowledge of these indicators has expanded beyond the traditional three of β-cells, skeletal muscle, and liver. The usefulness of biomarkers in predicting the forward risk of type II diabetes is still up for debate, though, particularly when considering anthropometric measurements, lifestyle factors, fasting glucose, and lipid levels. Over the past seven years, metabolomics research has been used primarily to generate a comprehensive and novel set of biomarkers for type II diabetes. These studies systematically analyze low molecular weight biochemicals called metabolites in a biological sampling. Elevated levels of hexoses, branched-chain amino acids, phospholipids, and triglycerides were related to prediabetes mellitus and type II diabetes, according to a 2016 meta-analysis of metabolomics research (52, 53).

Generating Origin of T2DM

According to the thrifty genotype theory, even if these genotypes are inappropriate in modern settings, they were advantageous during periodic feast and famine periods because they support metabolism and energy storage. According to this theory, inadequate nourishment during fetal development may cause physiological alterations in the body, such as a commutation in the mass and activities of β-cells and an elevation in insulin resistance. While these adaptations might help with early survival, they also raise the risk of nourishing chronic illnesses like Type II Diabetes Mellitus (T2DM) later in life. Low birth weight, which is usually the consequence of malnutrition in the womb, increases the chance of generating Type II Diabetes Mellitus in later life. The diagnostic criteria used and the group being studied influence the prevalence of gestational diabetes mellitus. In Europe (except in Italy), the prevalence of the illness varies between 1.2% and 3.1%, while in Southeast Asia, it varies between 1.9% and 13.7%. Comparing women without gestational diabetes to those with the disease, their risk of generating type II diabetes mellitus (T2DM) was seven times lower. High blood glucose levels at the time of pregnancy can raise the risk that children born to moms with gestational diabetes will develop type II diabetes. The combination of high body weight and exposure to gestational diabetes mellitus during pregnancy is the primary factor contributing to the increase in type II diabetes mellitus (T2DM) in Pima Indian children (54, 55, 56).

Other factors

People's inclination toward gut bacteria's role in generating type II diabetes has significantly increased in recent years. Changes in the composition and diversity of the gut microbiota have been linked to Type II diabetes. Compared to healthy individuals, the population with type II diabetes has less butyrate-producing bacteria in their gut microbiota (57, 58).

Epidemiology of complications in T2DM

Microvascular complications are distinguished from macrovascular complications, which include cardiovascular disease (CVD), by factors such as kidney, retina, and nervous system issues. The observational study, which covered 28 countries in Africa, Asia, Europe, and South America, found that 27 percent of people with type II diabetes had macrovascular problems, and 50% of people with the disease had microvascular problems. Cohort studies carried out in developed nations have shown that individuals with diabetes mellitus had a significantly greater incidence of microvascular and macrovascular illnesses, respectively, compared to those without diabetes. It is estimated that the incidence is ten to twenty times higher. Persons with diabetes mellitus are less likely to develop coronary heart disease but are more likely to experience renal problems and stroke in most developing countries. However, assessing the morbidity and mortality associated with type II diabetes complications is challenging due to the absence of a globally accepted classification, characterization, or diagnostic criteria for these problems (59, 60).

Cardiovascular disease

Compared to other populations, Americans are more affected by cardiovascular disease (CVD), which consists of conditions like coronary heart disease, cerebrovascular illness, and peripheral vascular disease. People with type II diabetes mellitus (T2DM) typically develop cardiovascular disease (CVD) 14.6 years earlier than people without diabetes. Furthermore, cardiovascular disease is more common and severe in people with type 2 diabetes. Comparing people without type II diabetes mellitus (T2DM), those with T2DM have a twofold increased risk of cardiovascular disease (CVD). This elevated risk persists despite the presence of age, smoking status, BMI, and diabetes mellitus as contributory factors. Furthermore, the risk of dying from vascular causes is increased by more than twice in people with diabetes mellitus. Diabetes mellitus, a condition more common in women, reduces or eliminates the preventive effect against cardiovascular disease (CVD) that is often reported in premenopausal women (61, 62, 63).

Renal disease

About 10% of death cases in people with type II diabetes are caused by renal failure. In the US, 44% of newly determined cases of end-stage renal disease (ESRD) are related to diabetes mellitus. Moreover, diabetic kidney damage is a condition that affects about 25% of Americans with Type II Diabetes Mellitus (T2DM) (19). This illness may show an ongoing decline in expected glomerular filtration rate, persistent albuminuria, or both. In the past, the leading cause of end-stage renal disease (ESRD) in China has been glomerulonephritis. But as of 2010, the primary reason for last-stage renal disease (ESRD) in the general masses was shown to be diabetes-linked chronic kidney disease. It has been the main reason for end-stage renal disease (ESRD) in hospitalized individuals since 2011. Compared to white people, Asian Americans with type II diabetes mellitus (T2DM) had an 80% greater prevalence of diabetes-related end-stage renal disease (ESRD). Furthermore, comparing Western countries, Asian countries have a noticeably higher frequency of diabetic kidney disease (64, 65).

Other complications

In the US, the average commonness of diabetic retinopathy is around 28.5 percent. Nonetheless, the frequency varies from 16 percent to 35 percent in Asian countries. In the United States of America, type II diabetes is the core reason for non-traumatic lower limb amputations. It is estimated that diabetes mellitus affects approximately one-third of amputees in the United Kingdom and approximately half of amputees in Australia. Type 2 diabetes can also worsen cognitive function and exacerbate mental health issues. It can also raise the risk of musculoskeletal, hepatic, and digestive complications. This risk can be increased directly or indirectly. Studies have indicated a correlation between type II diabetes and the rising risk of developing various cancers, including pancreatic, liver, and endometrial cancers (66, 67, 68).

Depression

Depression is highly prevalent among the general population. Depression frequently manifests as depressing emotions, decreased interest, increased guilt or low self-esteem level, changes in sleep or eating disorders, extreme exhaustion, and trouble focusing. The risk of suicide and mortality is significantly increased in cases of severe depression (9, 10, 11). Depression severely impairs a person's capacity to function and enjoy life, and it usually lasts for a long time. By 2020, depression is expected to overtake all other health concerns as the second most important global problem, according to the World Health Organization (WHO). Taking care of different mental health issues is a significant priority for the World Health Organization under the Mental Health Gap Action Program (12, 13).

Therefore, to guarantee a precise comparison between current and future data, a uniform approach to determining the frequency of depression within this time frame must be established. The worldwide prevalence rates of depression, including point, one-year, and lifetime prevalence, will be assessed by this meta-analysis. Participants will range in age from one to several decades old. This investigation surveyed a large and representative community sample between 1994 and 2014. By doing this meta-analysis, the researchers want to identify potential causes of the variation in the prevalence of depression worldwide. According to research (17), women experience depression symptoms twice as frequently as men do.

Risk factors of Depression in Diabetics:

A chronic metabolic disorder known as diabetes mellitus is becoming more common in the twenty-first century and is a serious health concern. The International Diabetes Federation (IDF) (18) projects that by 2045, there will be 629 million people worldwide with diabetes mellitus, up from 425 million in 2017. Diabetes complications can result in increased rates of disease, incapacity, and mortality, which pose a serious threat to all economies, particularly those that are expanding (19).

Over the past few decades, prediabetes and diabetes have been more common in both industrialized and developing nations. After controlling for population age disparities, a recent statewide survey on the Chinese mainland, which included 170,287 people from 31 provinces, found that the commonness of diabetes was 10.90 percent and that of prediabetes was 35.7%. 45.8% of older people had prediabetes and 20.2% had diabetes (20). Depression encompasses not just feelings of hopelessness, worthlessness, boredom, and disinterest in once-enjoyed activities but also a loss of contentment, vitality, and interest. Diabetes and depression are common in both developed and poor countries. Moreover, depression has been shown to increase the risk of developing diabetes, and diabetes has been indicated to increase the incidence of depressive symptoms (21, 22). Depression may make it challenging to regulate oneself and follow treatment plans. For more than 60 years, metformin has been a frequently recommended first treatment for type 2 diabetes. It lowers the amount of glucose produced in the liver while enhancing the body's utilization of insulin for glucose metabolism. Metformin has anti-inflammatory, antioxidant, and neuroprotective qualities, enhancing memory and learning and lowering blood sugar levels. Another study (22, 23) demonstrated that metformin medication, especially over an extended period, reduces cognitive decline in older adults with diabetes. Because of its pleiotropic pharmacologic activities, which target numerous pathophysiologic elements of the disorder, metformin is an effective treatment for co-morbid depression. The study discovered that metformin synergistically modulated the HPA axis, oxidative stress, and monoamine transmission to reduce both hyperglycemia and depressive-like behavior successfully.

Current studies

Researchers examined the commonness of nervousness and depression availability in people with and without diabetes, accounting for clinical and socio-demographic variables. All 217 participants in the cross-sectional research had a diagnosis of type II diabetes mellitus. The participants' ages ranged from 53.7 years on average to 8.1 years on standard. A total of 56.7% of the patients were female. A control group of one hundred healthy people who were about the same age as the diabetic patients was also part of this study. Most of the participants in the control group (67.0%) were female, and their average age was 36.9 (SD: 10.6) years. Using the subscale scores of the Hospital Anxiety and Depression Scale (HADS), this study evaluated the levels of nervousness (HADS-A) and depression (HADS-D) in people with diabetes compared with those without the disease. The study also included factors associated with diabetes and socio-demographic data. With rates of 42.4% and 35.5%, respectively, nervousness and depression were equally common in the groups without diabetes and those with diabetes. Among the group with diabetes, a significant correlation was found (p=0.035) between lower income and higher scores on the HADS-A and HADS-D.

Furthermore, there was a strong correlation between having a feminine gender identity and higher scores on the HADS-A (p<0.001) and HADS-D (p=0.009). On the other hand, the control group's sub-45 members showed noticeably higher HADS-A and HADS-D scores (p=0.008 for each). A significant difference in HADS-A ratings (p=0.009) was observed among individuals with diabetes and one or more diabetes complications. However, no other significant differences in HADS scores based on disease characteristics existed. The results showed that the most essential variables in predicting nervousness and sadness in people with diabetes were socio-demographic traits rather than diabetes-specific traits. Consequently, there was no appreciable difference in the levels of anxiousness and melancholy between the diabetes and control groups (8).

This cross-sectional research study aimed to investigate the risk factors for nervousness and depression in patients who visit family health centers and have diabetes and hypertension. The Hospital Anxiety and Depression Scale (HADS) was used to assess patients' mental health, while the Hypertension Compliance Assessment Scale (HCAS) was used to evaluate patients' adherence to antihypertensive treatment. There were 380 participants in the study; 170 of them had been diagnosed with hypertension (HT), 83 with type 2 diabetic mellitus (T2DM), and 127 with both conditions. According to the Hospital Anxiety and Depression Scale (HADS), a significant number of patients had symptoms suggestive of anxiety, whereas a smaller proportion showed signs suggestive of depression risk. Only a tiny percentage showed signs of nervousness and/or despair. Patients with good therapy adherence showed significantly lower ratings on the HADS-Nervousness (HADS-A) and HADS-Depression (HADS-D) scales than patients with poor therapy adherence (mean scores of 7.6 ± 4.3 and 5.8 ± 4.0, respectively). The results were acquired using the Hypertension Compliance Assessment Scale. For HADS-A and HADS-D, respectively, the $\chi 2$ values were 15.26 ($p < 0.01$) and 13.80 ($p < 0.01$). Diabetic patients with reasonable glycemic control had an average HADS-D score of 3.7 ± 2.9, significantly lower than those with poor glycemic control (4.5 ± 3.7) ($\chi 2 = 25.00$, $p < 0.05$). Diabetes, hypertension, depression, and nervousness are common disorders in primary healthcare. We discovered that people with diabetes and hypertension were likely to experience anxiety and depression, which is in line with earlier studies. Furthermore, our study has shown that this illness negatively affects both the management of blood sugar levels in diabetics and the adherence to hypertension medication (5).

The study included individuals with type II diabetes mellitus who were hospitalized and suffering from complications linked to their diabetes, including hyperosmotic hyperglycemic syndrome (HHS), hypoglycemia coma/seizures, and diabetic foot infections/ulcers. The study used cross-sectional data and was an observational investigation. Nervousness and depression were calculated using the Hospital Anxiety and Depression Scale (HADS). SPSS version 22.0 entered and analyzed the data (IBM Corp., USA).

Armonk is situated in the United States state of New York. Those surveyed had mean nervousness levels of 10.88 with a standard deviation of 4.075 and mean depression levels of 11.82 with a standard deviation of 4.049. Seventy people (or 49.2% of the overall patient population) reported having depression, while seventy-two people (or 50.7% of the total) reported having anxiety. People with painful neuropathy, nephropathy, or foot ulcers, as well as older people, people with diabetes for a more extended period, people undergoing non-insulin treatment, and women all demonstrated significant and statistically significant increases in their nervousness and depressive signs. Hospitalized persons with diabetes mellitus may experience anxiety and depression. The general quality of life is being exacerbated by the existence of these two crippling illnesses. If a person has type II diabetes, it is critical to recognize and treat their nervousness and depression with reason to improve their quality of life and lengthen their life span (6).

Diabetes mellitus patients have a markedly higher incidence of depressive disorders, which plays a significant role in their mental and behavioral health issues. The goal of the research is to learn more about the similarities and differences in quality of life between people with type II diabetes and those who also suffer from depression. The diabetes clinic of a Teaching Hospital in Kerala's Thiruvananthapuram district served as the site of this study. The study's suggested design was conducting a case-control investigation in a hospital. Eighty individuals, all of whom were eighteen years of age, were diagnosed with type II diabetes mellitus at the diabetic clinic. On the Hospital Anxiety and Depression Scale (HADS), the patients in question scored eight on the depressive subscale. Eighty patients with type II diabetes mellitus who saw the clinic concurrently with the experimental group made up the control group. On the Hospital Anxiety and Depression Scale (HADS), these patients' depression sub-scale ratings, however, were below 8. After receiving informed consent, data was collected. The quality of life was evaluated using the 36-item RAND (Research and Development) Health Survey (Version 1.0). The data was examined using the Mann-Whitney test. Alpha degree in all eight categories of the RAND 36 Item Health Survey, which gauges the quality of life, depressed patients rated themselves considerably lower than non-depressed patients, according to the statistical analysis. A quality-of-life evaluation has shown that persons with type II diabetes mellitus who also suffer from depression have a lower quality of life than people without depression. People with diabetes can have better lives if they get screened for depression and receive appropriate treatment (7).

The purpose of this research was to know the frequency and intensity of nervousness and depression among hospitalized patients diagnosed with type II diabetes mellitus and to investigate the variables linked to these illnesses. Techniques: 160 individuals with type II diabetes were admitted to the internal medicine wards at King Abdulaziz Medical City in Riyadh, Saudi Arabia, between January and August 2015. The endorsement of 158 patients served as proof of research participation. A self-administered questionnaire was divided into two portions. While the study's second phase used a proven screening approach to measure nervousness and depression, the first phase collected demographic data.

There are four intensity categories for nervousness and depression: mild, moderate, severe, and normal. In order to identify the independent variables connected to anxiety and depression, a logistic regression analysis was carried out for data analysis. The result: According to the screening test, 85.8% of research participants showed signs of melancholy, and 80.6% of individuals felt anxiety. Of the individuals who received a diagnosis of depression, 36 (42.4% of the total) reported feeling moderately to extremely uncomfortable. A hospital stay of eight days or more and a lack of physical exercise were found to be independently related to the likelihood of nervousness in diabetes patients undergoing treatment.

On the other hand, it has been demonstrated that elderly age, low income, and nephritis all raise the risk of depression. Most diabetic patients suffered anxiety, severe depressive disorder, or both while they were in the hospital. Because diabetic patients are likely to experience nervousness and sadness, it is wise to evaluate them when they are admitted to the hospital. This assignment needs to be finished while in the hospital (8).

Objective

• To know the frequency of depression in people with diabetes, visit the Teaching Hospital in Quetta.

MATERIAL & METHOD OF THE STUDY:

Design of the study:	Cross-sectional
Arrangements:	Medicine Department in OPD, Sandeman provincial hospital, Quetta.
Study horizon:	Approximately a month following the approval of the synopsis
Size of the sample:	113

The sample size is calculated using the WHO sample size calculator through the following formula.

$$n = \frac{z^2_{1-\alpha/2} P(1-P)}{d^2}$$

Confidence interval (%) = 99%,
Absolute precision required = 0.08
Anticipated population proportion in risk of developing depression= P = 0.25, reference# (3)
A sample size of 113 will be used as study participants.

Technique of sampling: Consecutive sampling

Criteria for inclusion:

- Type II diabetes has more than 5 years duration.
- Both genders, male and female, will be included
- Age more than 30 years.

Exclusion criteria

- Patients who are currently on medication for any mental disease, as this will improve their condition and affect their HADS score.
- Individuals with long-term medical conditions such as cancer, osteoporosis, rheumatoid arthritis, chronic liver disease as well as chronic kidney disease. Through their medical record, it will be discovered. Because the psychological effects of these chronic conditions may vary.
- Refusal from the patient because they are not required to participate in the study.
- Insulin-dependent, as patients with type 1 diabetes are included.

DATA COLLECTION PROCEDURE

Before proceeding, it was imperative to obtain the endorsement of the hospital's ethical committee. The study was conducted in the ODP Department of the Sandeman Provincial Hospital in Quetta. It was a cross-sectional research study carried out during the study. The study encompassed all patients with diabetes mellitus who did not need insulin and had been diagnosed with the condition for a duration exceeding two years. Individuals excluded from the study included those with insulin-dependent diabetes mellitus, a history of psychiatric disorder, age below thirty, diabetes duration less than five years, and significant co-morbid conditions such as chronic renal failure and thyrotoxicosis. The rationale for the exclusion can be derived from the described considerations. Provided they granted consent to participate in the trial, every patient was included in the investigation. Demographic information was gathered using a proforma for the study. The provided information encompasses the following variables: gender, age, occupation, education, area of residence, monthly earnings, period of diabetes, medication regimen, and treatment time. The patient was seen to have several co-morbidities, such as hypertension, hyperlipidemia, ischemic heart disease, and smoking.
Furthermore, we inquired about their engagement in alternative or complementary therapeutic approaches for diabetes. Patient evaluations were performed using the Urdu version of the Hospital Anxiety and Depression Scale to determine the presence of emotional distress and anxiety. The depression and nervousness subscales, each including seven items, were included in this measure. A score of 10 was used as the threshold to determine the cut-off point. If patients were diagnosed with depression and anxiety, they were subsequently referred to a psychiatrist to begin their therapy.

Table 1; Gender Distribution

		Freq	Per %
Validity	Male population	53.00	46.90
	Female Population	60.00	53.10
	Total	113.00	100.00

Figure 1 : Gender Distribution

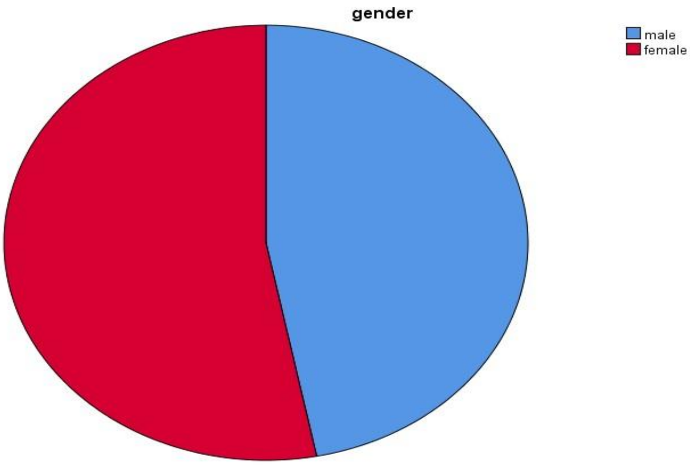


Table 2 Age-wise frequency of patients Age

Patient Age	Frequency	Valid Percent
32	2	1.8
36	6	5.3
39	3	2.7
42	4	3.5
43	2	1.8
45	6	5.3
46	6	5.3
47	6	5.3
48	12	10.6
49	4	3.5
50	2	1.8
51	7	6.2
52	9	8.0
53	2	1.8
54	2	1.8
55	5	4.4
57	2	1.8
58	5	4.4
60	2	1.8
61	3	2.7

62	5	4.4
63	5	4.4
64	5	4.4
68	2	1.8
71	3	2.7
73	3	2.7
Total	113	100.00

Table. 3 Residence of patients Residence

		Frequency	Per %	Valid %	Cumulative %
Validity	Urban Population	38.00	28.10	33.60	33.60
	Rural Population	75.00	55.60	66.40	100.00
	Total	113.00	100.00	100.00	

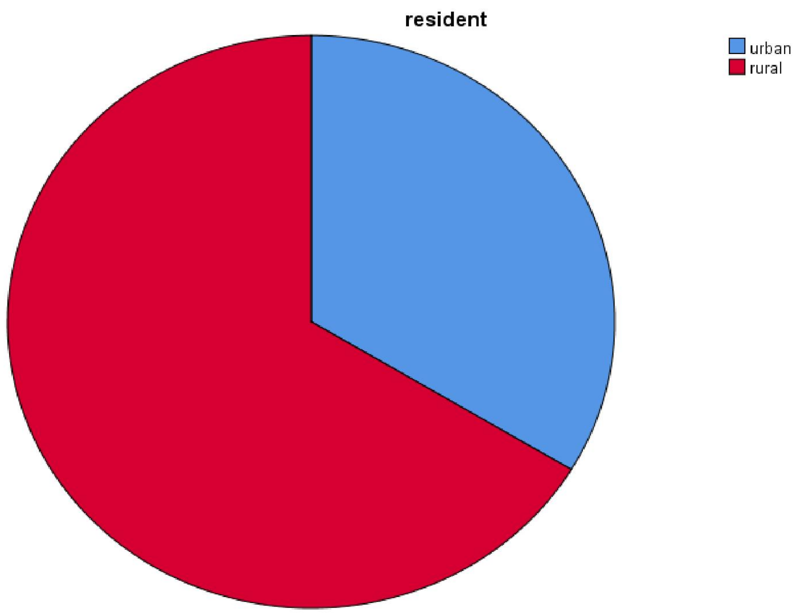


Figure 2: Residence of patients

Table 4 Duration of disease Duration

		Freq	%	Valid %	Cumulative %
Validity	2	3	2.2	2.7	2.7
	3	16	11.9	14.2	16.8
	4	11	8.1	9.7	26.5
	5	18	13.3	15.9	42.5
	6	14	10.4	12.4	54.9
	7	13	9.6	11.5	66.4
	8	19	14.1	16.8	83.2
	9	9	6.7	8.0	91.2
	11	3	2.2	2.7	93.8

	13	3	2.2	2.7	96.5
	14	1	.7	.9	97.3
	15	3	2.2	2.7	100.0
	Total	113	100.0	100.0	

Figure 3, duration of disease

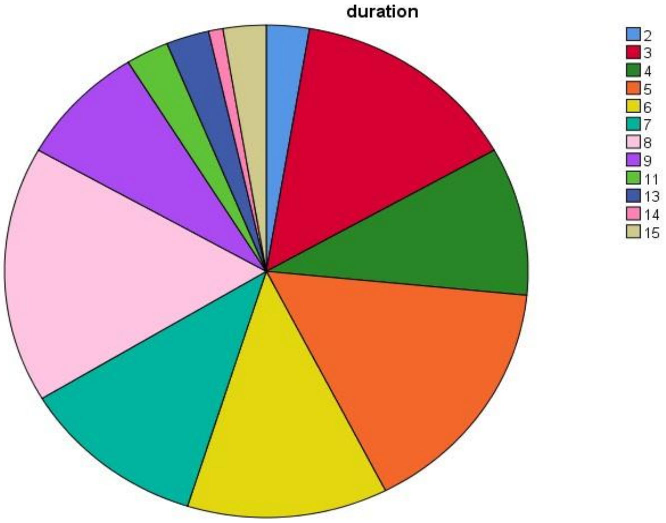


Figure 4: Co-morbidity

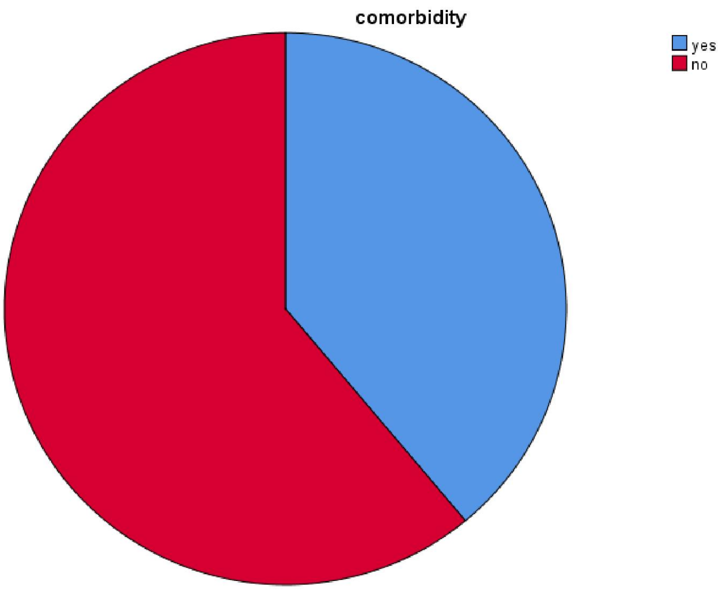
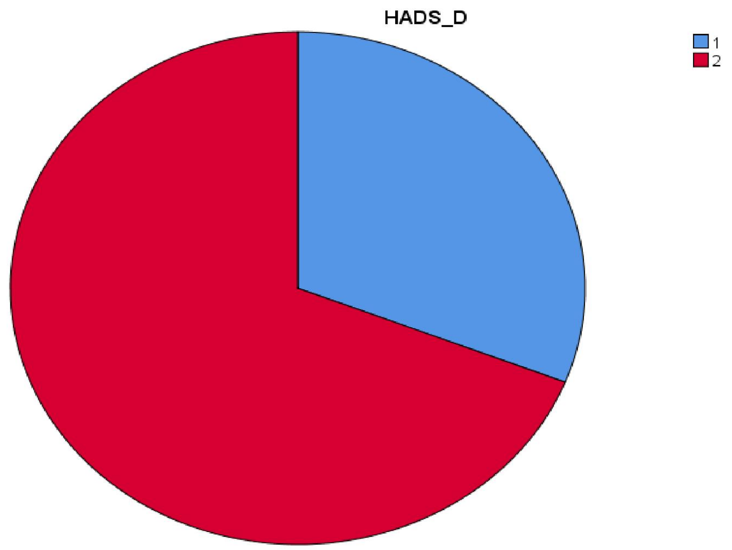


Figure 5: HADS-Depression in patients



DATA ANALYSIS TECHNIQUES AND TOOLS

All data was inputted using the SPSS version 23 program. Mean and standard deviation calculations are conducted on quantitative factors, like age and time horizon of diabetes. The frequencies and percentages of each element were calculated considering the job status, residence status, and gender of both genders. P-values equal to or lower than 0.05 were accommodated to have a statistical significance level.

RESULTS

The existing questionnaire was used to record all the gathered information for the study. An exploratory examination of the study data was performed using SPSS version 26.0. The study found a gender distribution among the participants, with 53.1% (60) female and 46.9% (53) being male, as indicated in Table # 01. The research study involved people aged between 32 and 73 years. The mean age was 52.08 years, with an SD of 9.30 years. The analysis of patient demographics showed that 66.4% (75) of the patients lived in rural areas, while the remaining 33.6% (38) were from metropolitan areas. The data is presented in Figure #01. The text is titled "The Third Table". All participants in the research study were diagnosed with type II diabetes mellitus (DMT2). The disease duration varied between 2 and 15 years, with an average of 6.43 years and a standard deviation of ± 2.88 years. Table 4 Co-morbidity was present in 38.9% (44) of the 113 participants in the research, while the remaining patients exclusively had diabetes mellitus type 2—figure 4. Twenty-one patients were determined with both diabetes mellitus and hypertension, whereas twelve individuals were determined with both diabetes mellitus and ischemic heart disease (IHD). The remaining 10 patients were determined with additional co-morbidities.

The Hospital Anxiety and Depression Scale (HADS) is a self-administered questionnaire used to identify clinical depression and anxiety simultaneously. Our research indicates that 68.1% of the patients, namely 77 individuals, had a HADS nervousness score higher than 10, resulting in a diagnosis of anxiety. According to the HADS scale, 31% of the people (14 in total) were judged to be experiencing depression. 31% of diabetes patients seeking treatment at tertiary care centers in Quetta are affected by depression. Item 5

DISCUSSION

The increasing prevalence of diabetes mellitus can be attributed to various factors, like the aging population, economic progress, and urbanization. Type II diabetes mellitus (T2DM) accounts for around 90% of all instances of diabetes mellitus. Nevertheless, population-level statistics may fail to differentiate between various forms of diabetes mellitus (27,28). The study's results revealed that there were 60 female participants, consisting of 53.10 percent of the total, and 53 male participants, making 46.9 percent of the total. The study participants' ages ranged from 32 to 73 years. The average age was 52.08, with a standard deviation of 9.30. Out of the total patient population, 66.4% (75) lived in rural areas, while the remaining 33.6% (15) resided in metropolitan settings. All participants in this research were diagnosed with type II diabetes mellitus (DMT2). The Middle East is significantly affected by the global epidemic of diabetes mellitus. The incidence of diabetes mellitus among individuals in this region varies from 9.5 percent in Oman to 25.4 percent in Saudi Arabia (32, 33). Although there is a lack of current regional data in Africa, the International Diabetes Federation (IDF) reported in 2015 that the commonness of diabetes in sub-Saharan Africa ranges between 2.1% and 6.7%. Between 2001 and 2009, the prevalence of type 2 diabetes mellitus (T2DM) among children and adolescents in the United States increased by 30.5%. Moreover, from 2002 to 2012, the occurrence of new cases of Type II Diabetes Mellitus (T2DM) has reiterated a yearly increase of 4.8%.

The disease lasts 2 to 15 years, with a mean of 6.43 years and a standard deviation of ± 2.88 years. Among the 113 participants in the study, 38.9% (44) had co-morbidity, whereas the rest had diabetes mellitus type 2. Out of the complete group of patients, 21 individuals were found to have both diabetes mellitus and hypertension, 12 persons had diabetes mellitus and ischemic heart disease (IHD), and the remaining 10 individuals had different additional health conditions. Research indicates that changing one's diet and lifestyle prevents Type 2 Diabetes Mellitus (T2DM). Significant clinical research has demonstrated that rigorous lifestyle modifications can reduce the prevalence of diabetes mellitus by 58 percent compared with control groups (40).

The Hospital Anxiety and Depression Scale (HADS) is a self-administered questionnaire used to diagnose nervousness and depression simultaneously. Our study found that 68.1% (77) of the patients had HADS nervousness scores exceeding 10, which signifies a diagnosis of anxiety. Out of the overall sample, 31% (14 individuals) had signs of depression as evaluated using the HADS scale. The commonness of depression among diabetes patients receiving medical care at a Teaching Hospital in Quetta is 31%. The findings of our study align with the World Health Organization's (WHO) prediction that depression will emerge as the second most substantial global health burden by 2020. The Mental Health Gap Action Program (12, 13) by the WHO also prioritizes mental illness as one of its main areas of concern. Based on prior published research, around 20% of persons diagnosed with type 2 diabetes mellitus (T2DM) suffer from depression. Knol's meta-analysis revealed that adults suffering from depression have a 37% higher likelihood of getting Type II Diabetes Mellitus (T2DM) in comparison to individuals who do not have depression (21, 22). The results of our investigation are consistent with the previously cited study.

CONCLUSION

We have determined that the incidence of depression among individuals who have diabetes is increasing at a concerning rate. Diabetes mellitus type 2 will substantially influence the patient's health. The research for this study was conducted at a solitary center with a relatively small population. In order to expose the concealed issue, it is crucial to conduct this investigation of a larger magnitude

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ANNEXURE

CONSENT FORM

I voluntarily offer to participate in this research study after reading and understanding this permission form. I willingly agree to participate, but if anyone participating in this study is negligent or otherwise legally liable, my consent has no bearing on any legal rights. I also realize that nothing on this permission form is meant to replace any applicable local, state, federal, or military laws.

Participant's Name:

____

Participant's signature:

____

PROFORMA

"Frequency of depression in diabetic patients visiting Teaching Hospital in Quetta."

S.No.____________ Date: ______________________

Patient's Name: ________________________________ Gender:_
Age:____Duration of diabetes: _______________
Type of diabetes: _________________________________

Residential status: □Urban
□Rural
Anyco-morbidity: □Yes
□No
If yes, name of co-morbidity: ____

HADS Score from the Attached Scale:____

Descriptive

DESCRIPTIVES VARIABLES=gender age duration resident co-morbidity namecomorb HADS_A HADS_D
/STATISTICS results = MEAN, Standard deviation, minima, and MAXima.

Notes

Result output		July 11th ,2021
Result related comments		
Result Input	Data collected	E:\Ushna work\firasat\spss data analysis. sav
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Handling of the missing value	Def of Missing	Missing values that are treated are based on user-defined
	Cases	All data other than missing.
Syntax		DESCRIPTIVE variable gender age duration resident co-morbidity namecomorb HADS_A HADS_D /STATISTICS = Mean, Standard deviation, minima, and maxima.
Resource	Processor Timing	0
	Elapsed Timing	0

Detail of Descriptive result

	Number	Min	Max	Mean	Standard Deviation
Gender	113	1	2	1.53	.501
age	113	32	73	52.08	9.309
duration	113	2	15	6.43	2.884
resident	113	1	2	1.66	.475
co-morbidity	113	1	2	1.61	.490
name-comorb	113	1	3	2.52	.792
HADS_A	113	1	2	1.32	.468

HADS_D	113	1	2	1.69	.464
Valid N (listwise)	113				

FREQUENCIES VARIABLES=gender age duration resident co-morbidity namecomorb HADS_A HADS_D
/STATISTICS = STD.DEV, RANGE, MEAN, MEDIAN /PIECHART PERCENT /ORDER = ANALYSIS.

Frequency (Freq)

Generated Output		July 11th 2021
Comments		
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Handling of the missing value	Def of Missing	Missing values that are treated are based on user-defined
	Cases Used	Statistics are under all cases with valid data.
Syntax		FREQ VARIABLES = gender age duration resident co-morbidity namecomorb HADS_A HADS_D /STATISTICS = STDDEV, RANGE, MEAN, MEDIAN /PIECHART PERCENT /ORDER = ANALYSIS.
Resources	Processor Time	00:00:02.08
	Elapsed Time	00:00:01.75

Statistics

		gender	age	duration	resident	Comorbidity	name-comorb	HADS_A	HADS_D
N	Valid	113	113	113	113	113	113	113	113
	Missing	22	22	22	22	22	22	22	22
Mean		1.53	52.08	6.43	1.66	1.61	2.52	1.32	1.69
Median		2.00	51.00	6.00	2.00	2.00	3.00	1.00	2.00
Std. Deviation		.501	9.309	2.884	.475	.490	.792	.468	.464
Range		1	41	13	1	1	2	1	1

Frequency Table

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Male	53	39.3	46.9	46.9
	Female	60	44.4	53.1	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	32	2	1.5	1.8	1.8
	36	6	4.4	5.3	7.1
	39	3	2.2	2.7	9.7
	42	4	3.0	3.5	13.3
	43	2	1.5	1.8	15.0
	45	6	4.4	5.3	20.4
	46	6	4.4	5.3	25.7
	47	6	4.4	5.3	31.0
	48	12	8.9	10.6	41.6
	49	4	3.0	3.5	45.1
	50	2	1.5	1.8	46.9
	51	7	5.2	6.2	53.1
	52	9	6.7	8.0	61.1
	53	2	1.5	1.8	62.8
	54	2	1.5	1.8	64.6
	55	5	3.7	4.4	69.0
	57	2	1.5	1.8	70.8
	58	5	3.7	4.4	75.2
	60	2	1.5	1.8	77.0
	61	3	2.2	2.7	79.6
	62	5	3.7	4.4	84.1
	63	5	3.7	4.4	88.5
	64	5	3.7	4.4	92.9
	68	2	1.5	1.8	94.7
	71	3	2.2	2.7	97.3
	73	3	2.2	2.7	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

Duration

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	2.2	2.7	2.7
	3	16	11.9	14.2	16.8
	4	11	8.1	9.7	26.5
	5	18	13.3	15.9	42.5

	6	14	10.4	12.4	54.9
	7	13	9.6	11.5	66.4
	8	19	14.1	16.8	83.2
	9	9	6.7	8.0	91.2
	11	3	2.2	2.7	93.8
	13	3	2.2	2.7	96.5
	14	1	.7	.9	97.3
	15	3	2.2	2.7	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

Resident

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	38	28.1	33.6	33.6
	Rural	75	55.6	66.4	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

Co-morbidity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	32.6	38.9	38.9
	No	69	51.1	61.1	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

name-comorb

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hypertension	21	15.6	18.6	18.6
	IHD	12	8.9	10.6	29.2
	Others	80	59.3	70.8	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

HADS_A

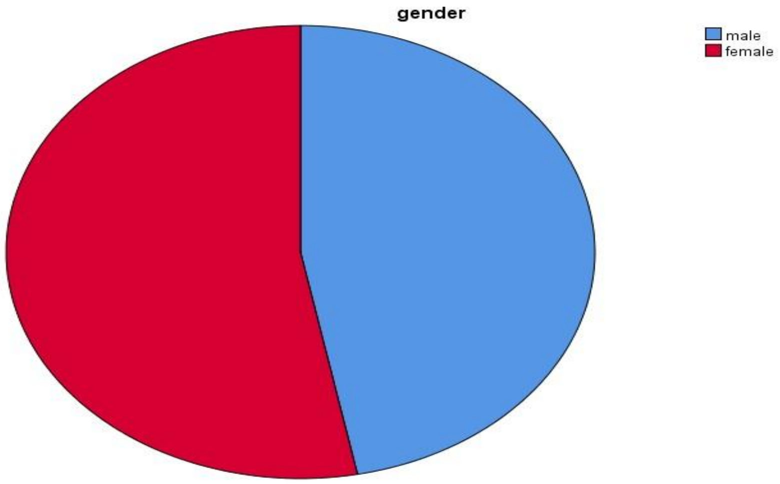
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	77	57.0	68.1	68.1
	2	36	26.7	31.9	100.0
	Total	113	83.7	100.0	

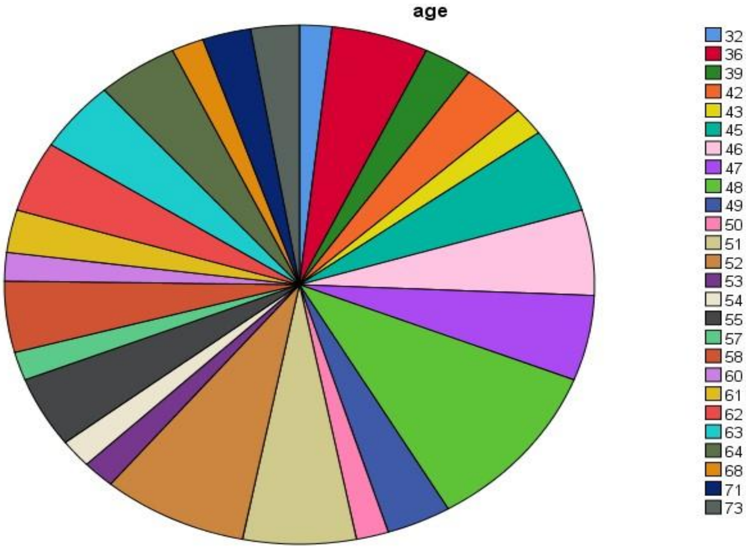
Missing	System	22	16.3		
Total		135	100.0		

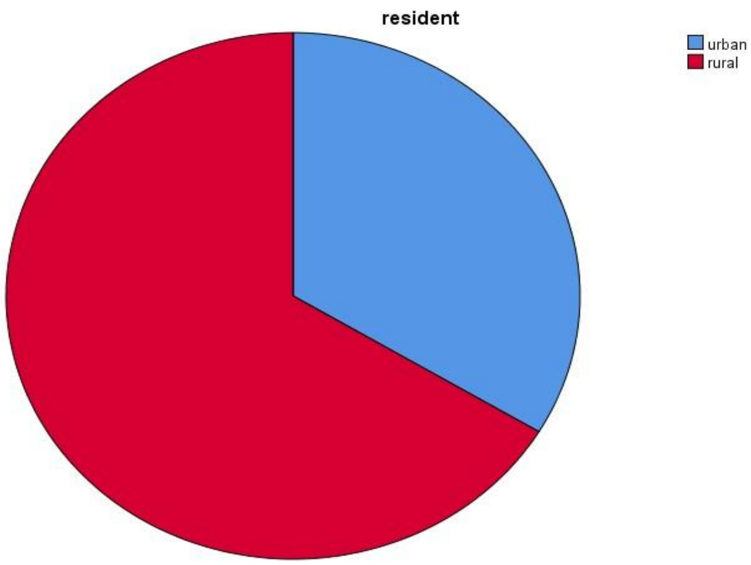
HADS_D

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	35	25.9	31.0	31.0
	2	78	57.8	69.0	100.0
	Total	113	83.7	100.0	
Missing	System	22	16.3		
Total		135	100.0		

Pie Chart



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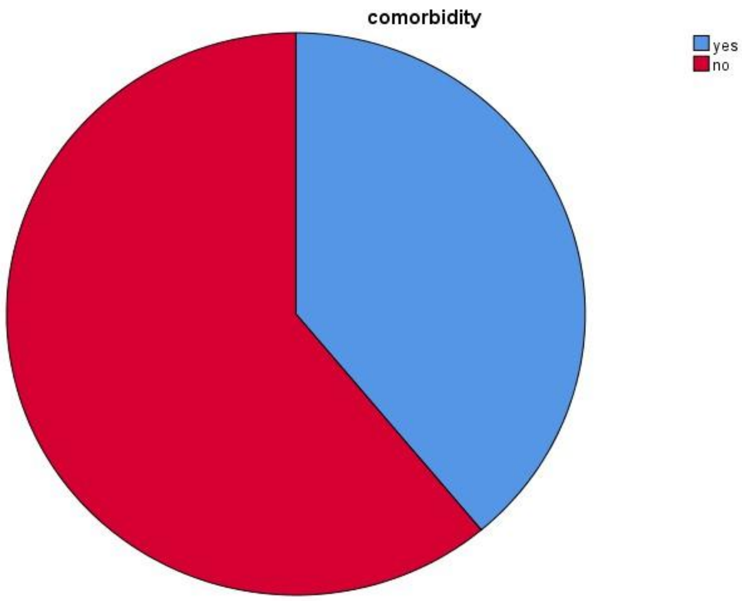
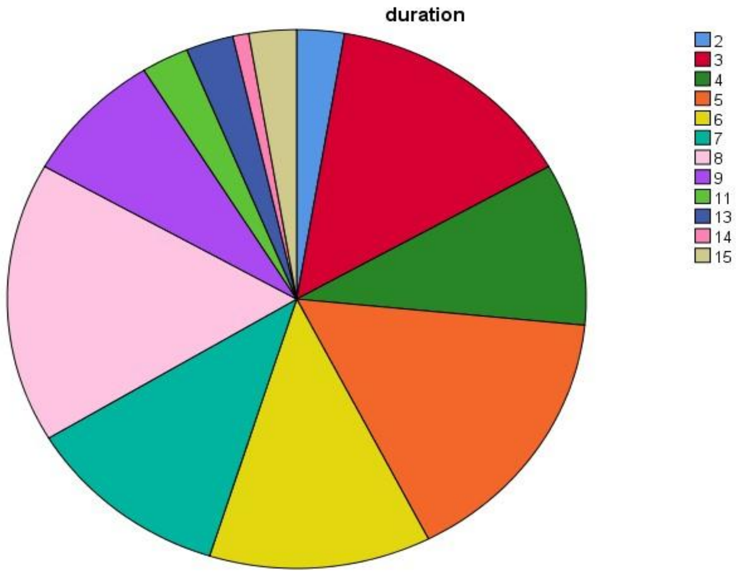
urban
rural


comorbidity
yes
no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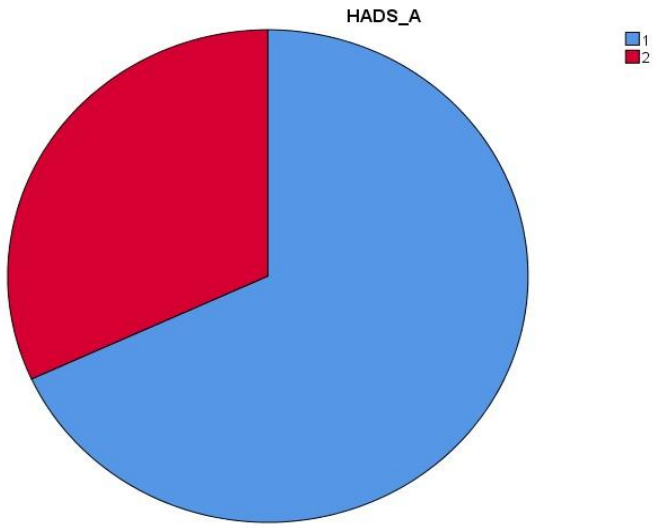
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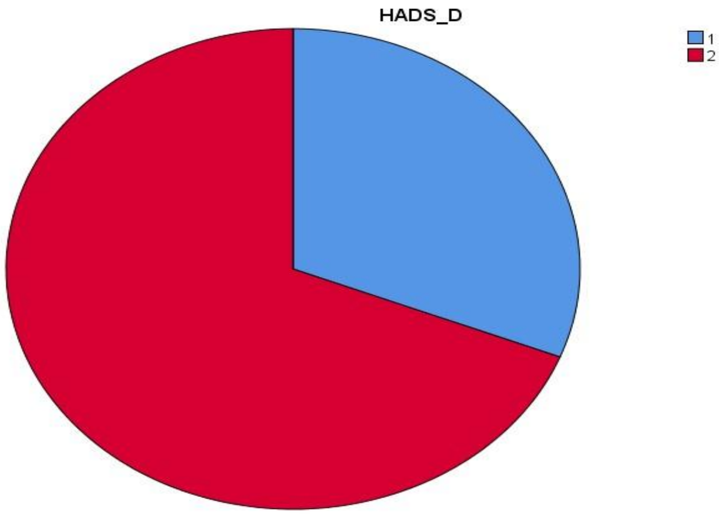
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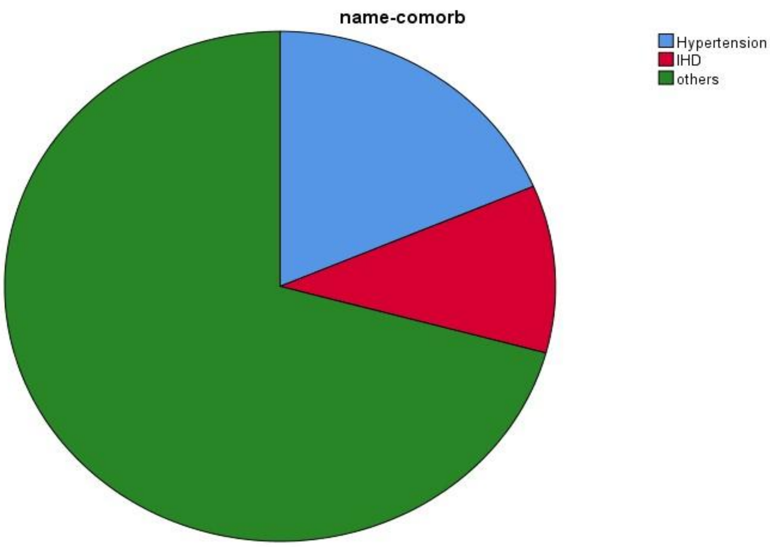
name-comorb
Hypertension
IHD
others