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Linkage between Anxiety and Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Individuals with Diabetes Mellitus are twice as likely to experience anxiety compared to the general population. Anxiety disorders have been linked to hyperglycemia in diabetic patients, and prolonged high blood sugar levels can lead to damage in various organs. This study aims to examine the relationship between anxiety and blood glucose levels in patients with Type 2 Diabetes Mellitus. The research employed an analytical observational design with a cross-sectional approach. From a population of 152 individuals, a sample of 60 was selected using simple random sampling. Data collection involved distributing questionnaires to assess anxiety levels and conducting blood sugar tests. Data were analyzed using the Spearman rank correlation test. The findings showed that most respondents (24 out of 60, or 40%) experienced moderate anxiety. Additionally, the majority (33 out of 60, or 55%) had blood sugar levels categorized as hyperglycemia. The Spearman's rho test revealed a significance value of 0.000 ($p < 0.05$) and a correlation coefficient of 0.811, indicating a very strong relationship. Therefore, the hypothesis (H1) is accepted, confirming a significant relationship between anxiety and blood glucose levels in individuals with Type 2 Diabetes Mellitus. The study concludes that anxiety is closely associated with elevated blood sugar levels in these patients, emphasizing the importance of managing emotional well-being to support better health outcomes.

Keywords: Anxiety, Blood Sugar Levels, Diabetes Mellitus

BACKGROUND

Elevated blood sugar levels, or diabetes mellitus (DM), refer to a group of metabolic disorders that impair insulin function and lead to hyperglycemia (Sholichin, 2019). DM is also recognized as a chronic metabolic condition caused either by insufficient insulin production by the pancreas or by the body's inability to utilize insulin effectively (Ministry of Health, 2014). The presence of high blood sugar and the potential for complications often leads to anxiety among individuals with DM (Mujabi & Yuniartika, 2018). This anxiety can influence fluctuations in blood glucose levels, making them unstable despite efforts through proper diet, exercise, and medication. Such instability is associated with the increased release of stress-related hormones like cortisol (a glucocorticoid), epinephrine (a catecholamine), and growth hormones. Anxiety manifests through emotional, behavioral, and physiological responses. Physiologically, it activates the hypothalamic-pituitary axis, affecting the endocrine system particularly by raising cortisol levels, which can interfere with insulin action and negatively impact blood glucose regulation (Sholichin, 2019).

In China, 7.3% of deaths are attributed to diagnosed diabetes (Lestari & Indradi, 2020). In Italy, diabetes was associated with 36% of patient deaths (Onder et al., 2020). According to the Indonesian Ministry of Health (2014), out of 800 recorded deaths, 83 were linked to diabetes. Hospitalized diabetes patients are generally at higher risk for severe complications

and mortality (Onder et al., 2020). In Indonesia, East Java ranks 10th in terms of diabetes prevalence, with approximately 6.8 million individuals affected (East Java Health Office, 2020). In Kediri Regency, the prevalence of diabetes mellitus in 2020 was 15,308 people (48%). The highest number of DM cases in the region was recorded at the following health centers: Ngadiluwih (162.5%), Ngasem (155.3%), Pagu (100%), Kunjang (86.8%), Ngadi (84.9%), Wonorejo (72.9%), Plosoklaten (76%), Puhjarak (74.7%), Pelas (63.1%), and Sambi (63.1%). For early screening of risk factors among the productive age population, 28,336 individuals (19.9%) were examined, consisting of 6,594 men (12.9%) and 21,742 women (23.8%) (Kediri District Health Office, 2020).

Blood glucose instability refers to fluctuations in blood sugar levels that deviate from the normal range, leading to either hyperglycemia or hypoglycemia. Hyperglycemia occurs when blood sugar levels are abnormally high, while hypoglycemia refers to levels that fall below normal (Paadilusari et al., 2014). Anxiety can trigger the release of hormones such as glucocorticoids (cortisol), catecholamines (epinephrine), and growth hormones. These physiological responses to anxiety can influence the hypothalamic-pituitary axis, thereby affecting endocrine function. This includes elevated cortisol levels, which can impair insulin activity, stimulate gluconeogenesis, and hinder glucose absorption, ultimately causing increased blood sugar levels. During the early stages of a stressful period such as a pandemic it is common for individuals to experience negative thoughts, including fear of infection, concerns about limited activities, uncertainty about when the situation will end, and other anxiety-inducing thoughts (Oktorina, 2021).

METHODS

This study employed a quantitative research method using an analytical observational research design with a cross-sectional approach. According to Nursalam (2018), research design serves as a framework that guides researchers in answering research questions or testing the validity of hypotheses. The cross-sectional design used in this study allows for the simultaneous measurement of variables, capturing data at a single point in time without any follow-up. In this design, researchers observe and analyze the relationship between independent variables and dependent variables without manipulating them. The purpose is to determine whether there is a statistically significant association or influence among the variables studied. The cross-sectional nature of the design is particularly useful for identifying patterns or correlations that exist in a population at a specific moment. Data collection was carried out through structured instruments such as questionnaires or surveys, which were administered to the participants during the same time period. This method ensures that the responses reflect current conditions or perceptions, allowing for valid and reliable analysis. The choice of a quantitative and analytical approach was based on the study's objective to test specific hypotheses and to measure the strength and direction of relationships between variables using statistical tools. The findings are expected to contribute to evidence-based conclusions that can be generalized to similar populations or settings.

RESULTS

According to research on anxiety, most people who visited patients with Type 2 DM experienced nervousness. out of 60 individuals, 24 (40%) fall into the intermediate category. Patients with diabetes may experience boredom, fatigue, worry, and even frustration as a result of the long-term therapy and care needed for the condition. Anxiety levels are 20% higher in DM patients than in non-DM patients. In individuals with diabetes mellitus, hyperglycemia is linked to anxiety disorders (Tsenkova V et al, 2013). An increase in glucocorticoid hormones (cortisol), catecholamines (epinephrine), and growth hormones causes blood glucose swings and unstable blood sugar levels in diabetics. Semirdji (2013).

Anxiety encompasses emotions, actions, and bodily reactions. Anxiety-related physiological reactions can impact the hypothalamic-pituitary axis, which can impact endocrine processes including elevated cortisol levels that negatively impact insulin function and blood glucose regulation (Butcher, 2015). Ariskawati et al.'s 2018 study revealed that the majority of responders with DM patients had moderate anxiety. Ariskawati, H. et al. (2018) found that anxiety significantly affected blood sugar levels in DM patients, with a p value (0.002) $<\propto(0.05)$.

A cross-tabulation of anxiety and age reveals that 10 individuals (16.70%) have mild anxiety, whereas those between the ages of 51 and 58 had higher anxiety levels. The findings of this study are different from those of Setyaningrum (2013), who found that the majority of respondents in the young age group suffer from severe anxiety (three out of five young respondents, or 60%) and that the majority of respondents in the middle age group suffer from mild anxiety (fourteen out of thirty middle-aged respondents, or 46.7%). Age has an impact on a person's psychology; the older a person is, the more emotionally mature they are and the more capable they are of handling different issues (Setyaningrum, 2013).

The anxiety table's cross-tabulation by gender reveals that among Type 2 DM patients, females experience the highest level of anxiety, accounting for 11 individuals (18.30%) with mild anxiety. A person's anxiety level can be greatly influenced by their gender, with women more likely than men to experience anxiety. Hormonal changes throughout the menstrual cycle put women at risk for more stressful life situations, making them more expressive and sensitive than men (Vellyana, Lestari, & Rahmawati, 2017).

The cross-tabulation of blood sugar levels by gender indicates that women are more likely to develop type 2 diabetes mellitus (DM), with 20 individuals (33.3%) affected. Gender plays a significant role in the development of diabetic neuropathy, with women being twice as likely to experience complications compared to men (Yuhelma et al., 2015). From a hormonal perspective, estrogen can disrupt iodine absorption in the intestines, which hinders the formation of nerve myelin, thereby increasing the risk of neuropathy in women. Conversely, the presence of testosterone in men is associated with a lower incidence of type 2 diabetes compared to women (Kruse J., 2011). Additionally, women face a higher risk of neuropathic complications due to factors such as pregnancy and parity, both of which are recognized as risk factors for diabetes mellitus (International Association for the Study of Pain, 2015).

According to a cross-tabulation of blood sugar levels by age, 21 individuals (35%) are more likely to have hyperglycemia, or elevated blood sugar, if they are between the ages of 43 and 45. After the age of 40, a person reaches an age where diabetic problems are more likely to occur (Herrera-Rangel, et.al., 2014). Studies have shown that those over 40 are six times more likely to develop type 2 diabetes (Zahtamal R, 2015). The study's findings demonstrate that the likelihood of neuropathy problems rises with age. This does not, however, rule out the possibility that young people with diabetes may get peripheral neuropathy (Bansal D et al, 2014).

According to the reviewed journal, patients who were treated for blood sugar-related conditions reported a high level of satisfaction. This satisfaction is closely linked to the comprehensive management of diabetes mellitus (DM), which is structured around four main pillars: education or counseling, medical nutrition therapy, physical activity or exercise, and pharmacological intervention. These pillars are applicable to all types of DM, including type 2 diabetes (PERKENI, 2015). Consistent implementation of these four components is essential for achieving optimal diabetes management. Satisfaction also reflects an emotional response that shapes one’s attitude, character, habits, and personality, ultimately influencing how individuals respond to various health conditions. Grateful patients tend to adopt a broader, more positive outlook on life.

Patient satisfaction at the hospital is also supported by several factors: doctors who communicate clearly and understandably, the availability of necessary medications, polite service from registration staff, prompt action from medical personnel, pharmacists who provide simple explanations about medication use, and clean facilities such as bathrooms and toilets. These elements contribute to the delivery of high-quality healthcare services that enhance patient satisfaction. Furthermore, satisfied patients are more likely to adhere to treatment, return for future care, and recommend the hospital's services to family and friends. The responsiveness and friendliness of the hospital staff, along with their willingness to provide thorough and timely information, further reinforce the hospital's commitment to excellent service and patient satisfaction.

DISCUSSION

Quality of service with satisfaction of Type II DM patients at the hospital

Based on the data analysis from the reviewed journals, it was found that the Spearman's rho test conducted by the researchers yielded a Sig. (2-tailed) value of 0.000, which is less than the significance level of $\alpha = 0.05$. Additionally, the correlation coefficient was 0.844, indicating a very strong relationship. As a result, the alternative hypothesis (H1) is accepted, confirming a significant relationship between anxiety and blood sugar levels in patients with type 2 diabetes mellitus. The Spearman Rank correlation test was used to assess the strength and direction of the relationship between the independent and dependent variables (Sugiyono, 2013). The data were analyzed quantitatively using the SPSS program. In this test, decision-making is based on a confidence level where $p < 0.05$ leads to rejecting the null hypothesis (H0) and accepting the alternative hypothesis (H1), indicating a significant relationship between anxiety and blood sugar levels in patients with type 2 DM. Conversely, if $p > 0.05$, H0 is accepted and H1 is rejected, meaning there is no significant relationship between the two variables.

CONCLUSION

1. The results of anxiety show that the majority of respondents who came to Type 2 DM patients at the Bhayangkara Hospital in Kediri City had anxiety.in the moderate category, namely 24 people (40%) of a total of 60 people.
2. The results of blood sugar level measurements show that the majority of respondents who came to Type 2 DM patients at the Bhayangkara Hospital in Kediri City had high blood sugar levels.in the hyperglycemia category, namely 33 people (55%) out of a total of 60 people.
3. Based on the test results*Spearman's rho*what the researchers did was that it was found that the value*Sig. (2-tailed)*which was obtained as much as $0.000 < \alpha\ 0.05$ while the correlation coefficient value of 0.844 means that the relationship is very strong so that H1 is accepted which means that there is a Relationship Between Anxiety and Blood Sugar Levels in Type 2 Diabetes Mellitus Patients at the Bhayangkara Hospital in Kediri City.

REFERENCES

Annisa, DF, & Ifdil, I. (2016). The Concept of Anxiety in the Elderly (Lansia). Counselor, 5(2), 93. https://doi.org/10.24036/02016526480-0-00.

Ardhiyanto, MD, Kusnanto, Nastiti, AA, & Arifin, H. (2019). SPRITUAL INTELLIGENCE IN SELF-MANAGEMENT IN PATIENTS WITH TYPE 2 DIABETES MELLITUS. Critical Medical and Surgical Nursing Journal, 8(1), 1–4.

Arifiati, RF, & Wahyuni, ES (2019). Improving Sense of Humor to Reduce Anxiety in the Elderly * Corresponding Author Aging is a natural process faced by humans, the most crucial stage is a decline in function or changes in biological aspects, psychological

aspects. Indonesian Journal of Islamic Psychology, 1(2), 139–169.
Astarini, AASD (2021). Description of the Anxiety Level of Pregnant Women During the COVID-19 Pandemic in the Work Area of the South Kuta Health Center Technical Implementation Unit. 32–33.
East Java Health Office. (2020). East Java Provincial Health Profile 2019. Central Java Provincial Health Office, 1–123. www.dinkesjatengprov.go.id
Kediri District Health Office. (2020). Kediri district health profile.
Fahmi, NF, Firdaus, N., & Putri, N. (2020). The Effect of Delay Time on Random Blood Glucose Levels Using the Poct Method in College Students. Nursing Update Journal, 11(2), 1–11. hhttps://stikes-nhm.e-journal.id.
Gufron, M. (2018). Appendix Anxiety Level Questionnaire. 5.
Kautsar, A., Gustopo, D., & Achmadi, F. (2015). Validity and Reliability Test of Hamilton Anxiety Rating Scale on Anxiety and Productivity of Visual Inspection Workers at PT. Widatra Bhakti. National Technology Seminar, 588–592.
Ministry of Health. (2014). Indonesian health profile. In Ministry of Health of the Republic of Indonesia.
Lestari, R., & Indradi, R. (2020). Continuing Development Medical Education (Cdme) Fk-Umm 2 0 2 0. Webinar Series 1: COVID-19, What and How? "Covid-19 in Family Medicine Review."
Maulasari, Y. (2019). Factors Related to Anxiety Levels in Type 2 Diabetes Mellitus Patients. Faculty of Sports Science, Semarang State University, 2.
Mujabi, MF, & Yuniartika, W. (2018). Relationship between Blood Sugar Levels and Depression Levels and Physical Activity in Patients with Diabetes Mellitus. Journal of Nursing Science News, 11(2), 73–83. https://doi.org/10.23917/bik.v11i2.10577.
Muyasaroh, H. (2020). Study of Types of Anxiety in Cilacap Society in Facing the Covid 19 Pandemic. LP2M UNUGHA Cilacap, 3. http://repository.unugha.ac.id/id/eprint/858.
Nursalam. (2018). Concept and Application of Nursing Science Research Methodology. 2nd ed. Jakarta: Salemba Medika; (pp. 1–60).
Oktorina, B. (2021). Psychosocial Nursing Care for Mr. J with Anxiety (pp. 1–49). https://osf.io/preprints/nz4cq/.
Onder et al., 2020). (2020). the relationship between self-care management and quality of life of type 2 diabetes mellitus patients in the era of the Covid-19 pandemic in the Ibuh Health Center working area, Payakumbuh City. Angewandte Chemie International Edition, 6(11), 951–952., 19, 1–16. http://scholar.unand.ac.id/72210/.
Paadilusari, I., Pertama, P., Second, P., & Medicine, F. (2014). Page Validation of the Relationship between K a D a RHB a IC with K a D a RGUL a SEW a KTU blood at P a SIENDI a BETESMELITUS At HOME a HS a KITMUH a MM a DIY a HP a LEMB a NGPERIOD 1 J a NU a RI 2013-31 OCTOBE.
PERKENI. (2021). Practical Guidelines for Insulin Therapy in Diabetes Mellitus Patients 2021. Pb Perkeni, 32–39.
Rahmitha, N. (2017). ANXIETY LEVEL IN PRIMIGRAVID PREGNANT WOMEN IN THE THIRD TRIMESTER AT THE TAMALANREA DISTRICT COMMUNITY HEALTH CENTER, MAKASSAR (Vol. 110265, p. 110493).
Sholichin. (2019). Comparative Study of Blood Sugar Levels Before and After Relaxation in Type 2 Diabetes Mellitus Patients at PKM Juanda Samarinda. June, 2(1), 37–47.
Soelistijo, & Al., E. (2015). Guidelines for Management and Prevention of Type 2 Diabetes Mellitus in Indonesia. In Perkeni.
Sugiyono. (2013). Educational Research Methods, quantitative approach. intro (PDFDrive).pdf.