



Research Article

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A CROSS-SECTIONAL STUDY ON THE PROPORTION OF DEPRESSION, ANXIETY AND STRESS AMONG MADHUMEGAM (TYPE 2 DIABETES MELLITUS) PATIENTS

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ABSTRACT

Background: The prevalence of depression, anxiety and stress is common among madhumegam (Type 2 Diabetes mellitus) patients. Association of depression, anxiety and stress increase the risk of madhumegam (Diabetes mellitus) and its complications and reduce the quality of life. Hence, this study aimed to assess depression, anxiety and stress among patients with madhumegam (Diabetes mellitus). Materials and Methods: The cross-sectional study was carried out among 100 patients those who purposively selected and clinically diagnosed madhumegam (Diabetes mellitus) attending Ayothidoss Pandithar Hospital, National Institute of Siddha, Tambaram Sanatorium, Chennai. The patients were selected by inclusion and exclusion criteria and interviewed using a pre-designed DASS 21 Questionnaire. Data were analysed by using inferential statistics. Results: Out of 100 patients, 23% of patients had depression, 30% of patients had anxiety, and 12 % of patients had stress. Conclusion: Patients with madhumegam (T2DM) had significantly high rates of depression, anxiety and stress. Hence, regular screening of Diabetes Mellitus patients for psychological distress is recommended, along with a diabetes management plan for early identification and treatment.

Keywords: Madhumegam, Diabetes mellitus, Depression, Anxiety and Stress, Cross-sectional study.

INTRODUCTION

The Siddha system is one of the ancient systems of medicine. Siddha system of medicine, diseases are classified into 4448 types based on three humours: vatha, pitha, and kabha. According to Yugi vaithiya sinthamani, mega noi is classified into 20 types; four come under vatham, six come under pitham, and ten come under kabam. Madhumegam (Diabetes mellitus) is one of the types of mega noi that comes under pitham. According to siddhar agasthiyar, excessive intake of ghee, milk, fish, and toddy and excessive indulgence in sex lead to madhumegam (Diabetes mellitus) and extreme body hunger, a clinical feature of diabetes.

Diabetes mellitus is a chronic non-communicable disease characterised by hyperglycemia caused by an absolute or relative insulin deficiency. It is classified as type 1, type 2, gestational, and others ¹. The typical symptoms of diabetes mellitus were excessive thirst, polyuria, nocturia, and rapid weight loss. Uncontrolled diabetes may lead to increased susceptibility to infection, and patients may present with skin sepsis (boils) or genital candidiasis and pruritis vulva or balanitis ².

At the global level, diabetes incidence increased in day-to-day life. The global diabetes prevalence in 2019 was 9.3% (463 million) which will be raised to 10.2% (578 million) and 10.9% (700 million) by the year 2030 and 2045 respectively ³. According to WHO, depression is a common illness worldwide, with an

estimated 3.8 % of the population affected, including 5.0% among adults and 5.7% among adults older than 60 years ⁴.

Poor sleep, lack of physical exercise and diet are the common causative factors for diabetes mellitus and depression. These factors may activate and disturb the stress system. Hypothalamus – Pituitary – Adrenal axis (HPA-axis) and sympathetic nervous system (SNS) will be affected when a person is under abnormal stress. This results in the increased production of adrenal hormones such as adrenalin and nor adrenalin. In turn, Hypercortisolaemia in blood and prolonged sympathetic nervous system activation leads to insulin resistance. Visceral obesity and insulin resistance also result in type 2 diabetes mellitus and metabolic syndrome.

On the other hand, behavioural consequences will occur in chronic stress conditions. The adrenalin and cortisol hormones may stimulate the fear system, causing anxiety, anorexia or hyperphagia. These mediators also cause tachyphylaxis of the reward system, inducing depression and craving for food, in hippocampus neurogenesis disturbed by increased cortisol. The hippocampus area is responsible for diabetes mellitus and depression ⁵.

The immune system is also disturbed directly by chronic stress or Hypothalamus – Pituitary – Adrenal axis (HPA axis) or sympathetic nervous system (SNS), thereby increasing the production of inflammatory cytokines. They interact with the

normal function of beta cells of the pancreas to cause insulin resistance. This promotes the development of type 2 diabetes mellitus ^{6,7}.

Depression is a common mental disorder characterised by sadness, loss of interest, disturbed sleep or appetite, tiredness and poor concentration ⁸. Anxiety is a feeling of worry, restlessness, headache, muscle ache, nervousness or unease about something. Stress is a state of mental or emotional strain or tension resulting from adverse or demanding circumstances ⁹.

Many studies have shown increased depression and anxiety in diabetes mellitus. To ensure holistic treatment of patients with diabetes mellitus attending Ayothidoss pandithar hospital, their stress, depression /anxiety status must be identified. This study is an initial step in identifying depression, anxiety and stress in diabetes patients, which was conducted by designing an appropriate treatment protocol.

MATERIALS AND METHODS

This is a hospital-based, observational cross-sectional study in which 100 madhumeagam (Type 2 diabetes mellitus) patients were selected using a non-random sampling method. Men, women and transgender with a history of madhumeagam (Type 2 diabetes mellitus) between the age group of 20 to 60 years were selected for the study. This study was conducted at OPD of Ayothidoss

pandithar hospital, National Institute of Siddha, Tambaram Sanatorium, Chennai. Known cases of psychiatric illness, autoimmune diseases like rheumatoid arthritis, SLE, cancer and AIDS and hypertension patients were excluded.

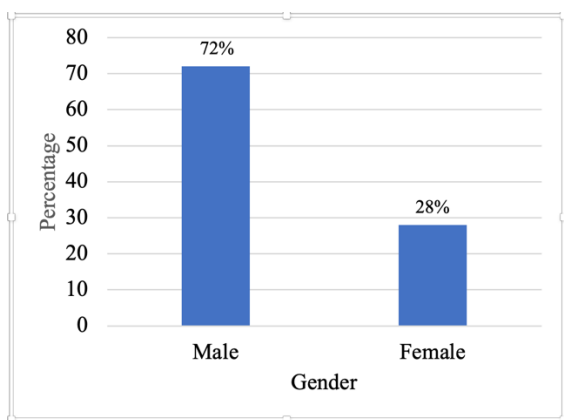
This study was conducted after obtaining approval from the Institutional Ethical Committee IEC NO - NIS/IEC/2021/MP-5. This study was also registered in CTRI (Clinical Trial Registry – India) - CTRI/2022/02/040051.

Data were collected by distributing a self-administered questionnaire composed of two parts. The first section was about the sociodemographic data of each patient, the duration of diabetes, and the complication of diabetes mellitus. The second part of the questionnaire was to assess depression, anxiety, and stress, which was carried out by using a previously validated Tamil version of the depression, anxiety, and stress scale (DASS-21) questionnaire. It consists of 21 items distributed in three scales, namely depression, anxiety, and stress, i.e., every seven items. Subjects are asked if they experienced symptoms the past week. These items are designed to assess the symptoms of depression, anxiety, and stress symptoms on a scale from ‘0’ (does not apply to me) to ‘3’ (applies to me most of the time).

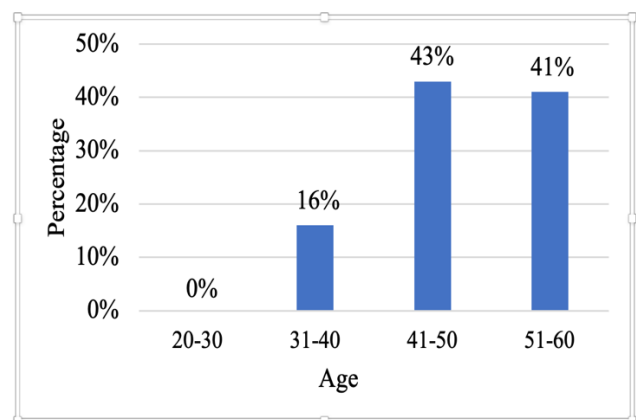
Data management and analysis were performed with a statistical package for social science (SPSS). Statistical significance was considered at a p-value < 0.05.

RESULTS

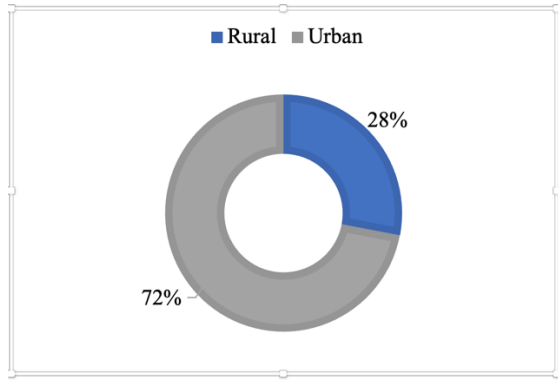
Factor	Predominant Category	Percentage
Gender	Male	72 %
Age	41-50 years	43 %
Demographic data	Urban	72 %
Marital status	Married	99 %
Occupation	Semi-skilled work	40 %
Education status	Middle school	32 %
Socio economic status	Lower middle	36 %
Diet	Non-veg	75 %
Sleep pattern	Good	57 %
Family history of DM	Positive	61 %
Habit	No bad habit	76 %
Duration of the disease	0-5 years	72 %
Treatment history	Siddha medicine only	42 %
Depression	Mild	19 %
Anxiety	Moderate	18 %
Stress	Mild	7 %



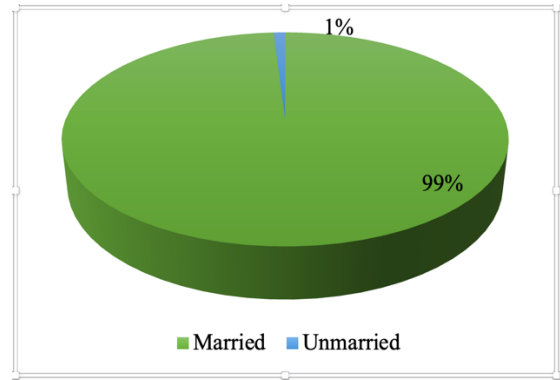
Graph 1: Gender distribution in madhumeagam patients



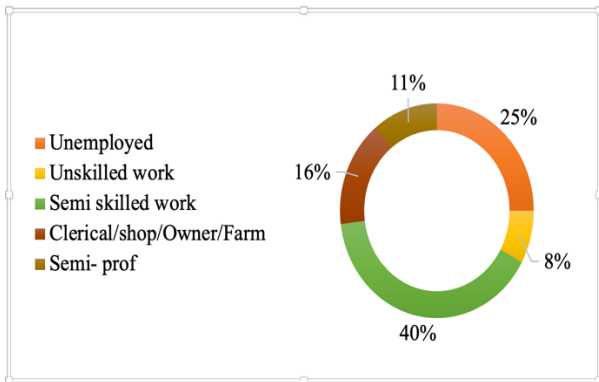
Graph 2: Age distribution in madhumeagam patient



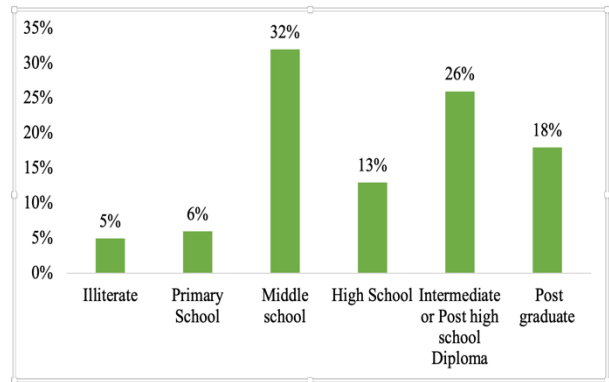
Graph 3: Demographic distribution in madhumeagam patients



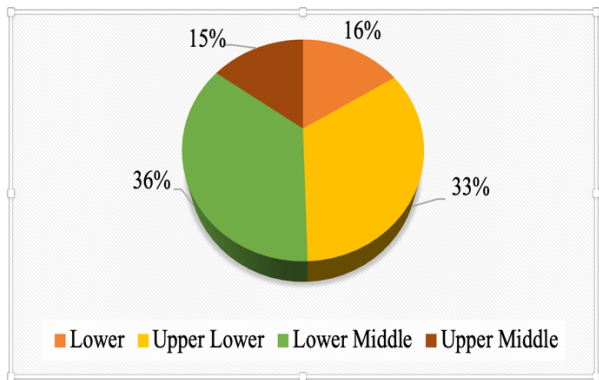
Graph 4: Marital status in madhumeagam patients



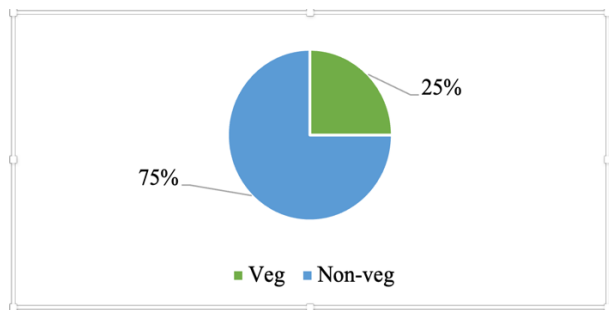
Graph 5: Occupational distribution in madhumeagam patients



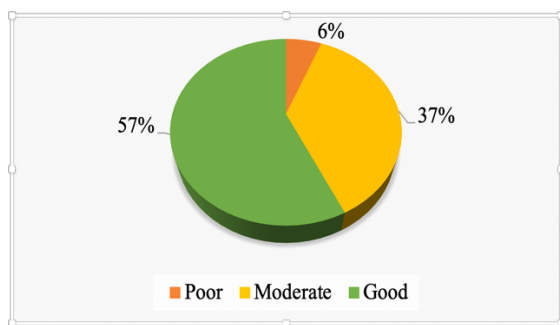
Graph 6: Educational status in madhumeagam patients



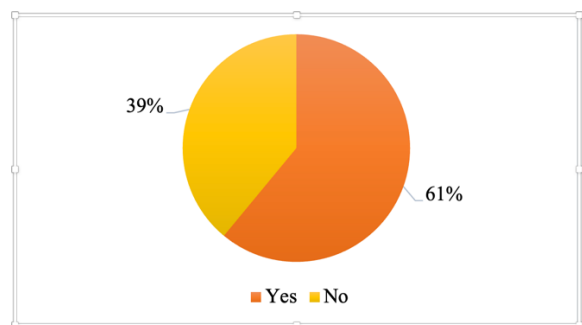
Graph 7: Socioeconomic status in madhumeagam patients



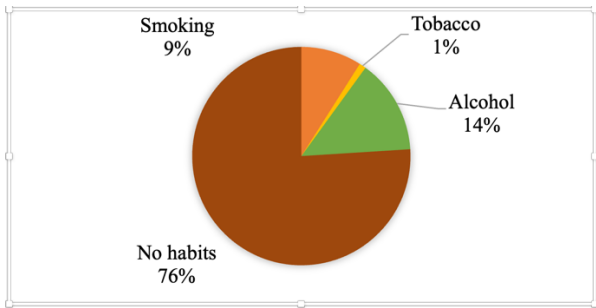
Graph 8: Diet in madhumeagam patients



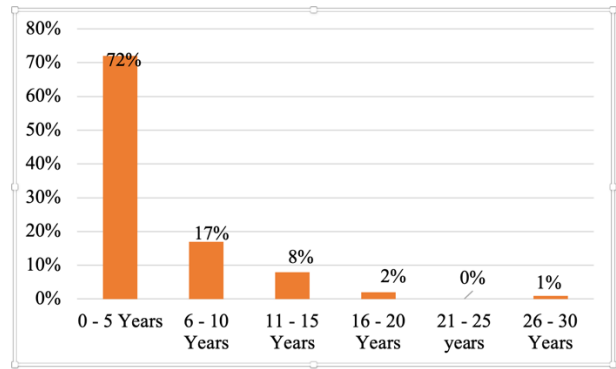
Graph 9: Sleep distribution in madhumeagam patients



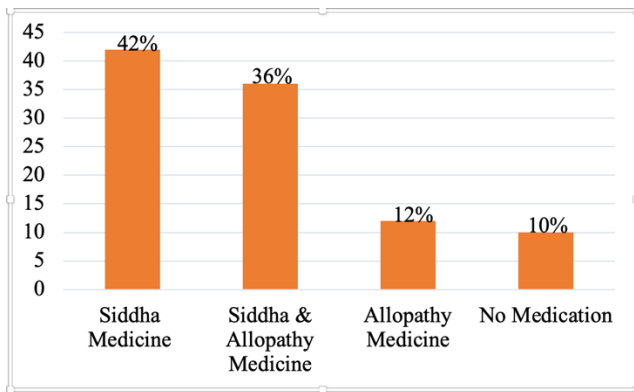
Graph 10: Family history in madhumeagam patients



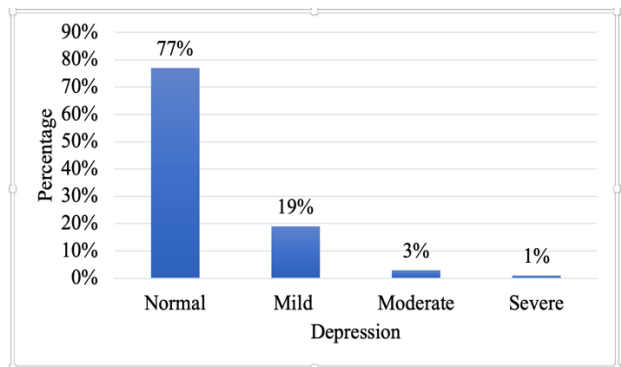
Graph 11: Habits in madhumeagam patients



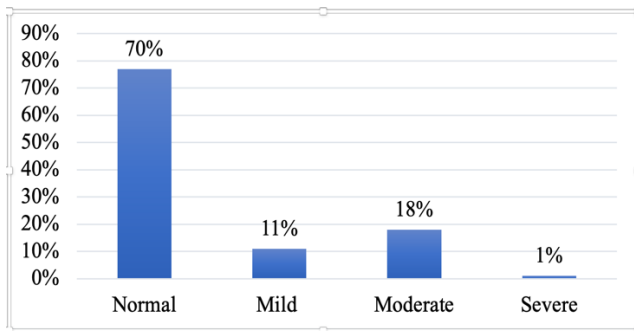
Graph 12: Duration of illness in madhumeagam patients



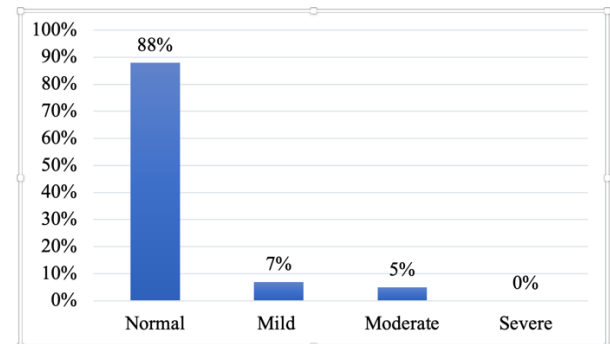
Graph 13: Treatment history in madhumeagam patients



Graph 14: Depression in madhumeagam patients



Graph 15: Anxiety in madhumeagam patients



Graph 16: Stress in madhumeagam patients

DISCUSSION

A chronic complication of DM is classified into microvascular and macrovascular, responsible for significant morbidity and mortality. Microvascular complications have a high prevalence rate, including neuropathy, retinopathy and nephropathy. The macrovascular complication includes cardiovascular disease, stroke and peripheral artery disease¹⁰. Apart from these, depression, stress and anxiety are also seen in Diabetes mellitus. Compared to ordinary people, depression is two times more common in patients with diabetes mellitus. In this study, the proportion of depression, anxiety and stress in madhumeagam (Diabetes mellitus) patients reporting at Ayothidoss pandithar hospital was evolved and statistically analysed.

The patients reported with madhumeagam (Diabetes mellitus) in the age group of 20 – 60 years are included in the study. Informed consent was obtained from the patients. The data regarding depression, anxiety and stress was acquired by a pre-designed DASS 21 questionnaire^{11,12}.

Of the 100 patients studied, 72 (72%) were male, and 28 (28%) were female. A study conducted in Ecuadorian; women are more likely to be diagnosed with depression, anxiety and stress than men¹³. But in the present study, among the 100 patients observed, the male is more likely to be depressed because of their occupation. There is a significant p-value (0.00) in relation to gender and anxiety.

Mainly the patients (43%) belong to the age group of 41-50 years, and 51-60 (41%) years, and a minimum of them (16%) belong to the age group of 31-40 years. A study conducted in the primary health care centre in New Belgrade revealed that anxiety and depression were reported more in the age group of 40-49 years¹⁴.

Regarding marital status, 99% of the sample population was married.

Among the 100 patients, nearly 40% were semi-skilled, 25% were unemployed, 16% belonged to clerical/shop/owner, and minimal belonged to semi-professional, 11% and unskilled workers 8%. Occupation plays a significant role in the development of

depression and anxiety. The p-value for depression and anxiety is 0.02 and 0.006, respectively. This shows that depression and anxiety developed in patients with diabetes mellitus in relation to occupation. A study among older Koreans revealed that the employed group showed lower late-life depression symptoms prevalence than the non-employed group¹⁵.

Regarding the demographic data, 72% of cases belonged to an urban area and 28% to a rural area. There is a significant relationship between the development of depression and stress in diabetes patients. The p-value for depression and stress are 0.016 and 0.013, respectively.

Among the 100 madhumegam patients, 5% patients were illiterate, 6% were in primary school, 32% completed their middle school, 13 % were in high school, 26% completed their diploma and 18% of cases completed postgraduate.

Among 100 madhumegam (Diabetes mellitus) patients, most of the patients belonged to the lower middle-income group 36 (36%), 33 (33%) of cases belonged to the upper lower, 16 (16%) of cases belonged to the lower and least cases represented from upper middle income 15 (15%).

Among 100 madhumegam (Diabetes mellitus) patients, 9 cases were smokers (9%), 1% case was tobacco chewer, and 14% of cases were drinkers. A review study on the association of cigarette smoking with depression and anxiety revealed a significant relationship between smoking and mental health¹⁶.

Among 100 madhumegam (Diabetes mellitus) patients, 75 (75%) of cases were non-vegetarians, and 25 (25%) of cases were vegetarian. In a review and meta-analysis study on vegetarianism compared with mental health and cognitive outcomes, vegetarians were at increased risk for depression and had lower anxiety scores¹⁷.

Among 100 madhumegam (Diabetes mellitus) patients, 57 (57%) of cases were with good sleep, 37 (37%) of cases were with moderate sleep, and 6(6%) of cases were with poor sleep. The study conducted among medical students in Saudi Arabia on the quality of sleep and mental health stated that sleep quality was significantly associated with depression (p-value = 0.03), anxiety (p = 0.007) and stress (p = 0.01)¹⁸. But the present study shows no significant correlation between sleep patterns and DAS symptoms.

61(61%) of cases had a family history of diabetes, and 39 (39%) had no relevant family history. A study on the effect of a family history of diabetes and sleep quality, depression and anxiety showed that patients without a family history of diabetes exhibit more anxiety and depression and had more sleep problems than patients with a family history of diabetes¹⁹.

Among 100 madhumegam (Diabetes mellitus) patients, 72(72%) of cases were diabetic within five years duration, 17 (17%) of cases had diabetes for a period of 6-10 years, and 8% of patients within 11-15 years. The least number of cases (2%) were found to have diabetes mellitus for 16-20 years. There are no cases to be reported at the duration of 21-25 years, and 1% of cases reported at the duration of 26-30 years. A study regarding the duration of diabetes and its association with depression in later life showed that the association between time lived with the diagnosis of diabetes and the risk of depression is 'J-shaped'²⁰.

When considering the treatment history, 42 (42%) of cases were taking Siddha medications only, 36 (36%) of cases were taking Siddha and allopathy medication, 12(12%) of cases were taking

Allopathy medications only and 10 (10%) of cases were not under treatment for Diabetes.

Among 100 madhumegam (Diabetes mellitus) patients, 23 % patients had depression, 30 % patients had anxiety, and 12 % patients had stress. There is a significant relationship between gender, occupation, and demographic data.

Among 23% of madhumegam (Diabetes mellitus) patients with depression, 19 % showed mild symptoms, 3% had moderate symptoms, and 1% had severe symptoms of depression.

Among the 30 % of madhumegam (Diabetes mellitus) patients with anxiety, 11% had mild anxiety, 18 % had moderate anxiety, and one percentage had severe anxiety.

Among 12% of madhumegam (Diabetes mellitus) patients with stress, 7% had mild stress, and 5% had moderate stress. There are no cases reported of severe symptoms of stress.

CONCLUSION

In this study, among the 100 madhumegam (Diabetes mellitus) patients who visited OPD of Ayothidoss pandithar hospital, National Institute of Siddha, Tambaram Sanatorium, 23 % patients had depression, 30 % patients had anxiety, and 12 % patients had stress. This study revealed that the madhumegam (Diabetes mellitus) patients survived with the symptoms of depression, anxiety and stress.

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