(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 6, Issue 3 , Page No: 406-416
May-June 2023

IJMSCR

Modified Hospital Anxiety And Depression Scale (Mhads) For South Indian Type 2 Diabetes Patients : A Single Centre Prospective Study

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Introduction : Since depression and anxiety are a serious concern in diabetic patients, proper screening and diagnosis are very important. So the present study helps to develop a screening scale specifically for diabetic patients and also gives an idea about the prevalence and association of depression and anxiety in diabetic patients.

This study aims to determine the reliability of modified depression anxiety scale in patients visiting tertiary care hospital and to study the prevalence of the two psychiatric conditions in the population.

Background: The current cross- sectional, prospective observational study was conducted on type 2 diabetes patients visiting a tertiary care hospital to assess the prevalence severity of depression and anxiety by using the modified hospital anxiety and depression scale (HADS).

Materials and Methods

Statistical analysis: Cronbach's alpha is used check the reliability of the questionnaire (mHADS). Chi- Square test was used to find the association of categorical variables whereas Mann Whitney U test was used for comparing means and P value.

Results: The study analysed 500 patients using modified HADS, to determine the severity and found that males [n=298(97.7%)] and alcoholics [n=286(97.6%)]s were more depressed than female [n=189(96.9%)] diabetic patients . Patients who were underweight [n=11(100%)] were found to be severely anxious and depressed. Females and chronic smokers were found to suffering from severe anxiety.

Conclusions: The reliability of modified depression anxiety scale in was determined and study also found that diabetes patients had a high prevalence of both depression and anxiety.

Keywords: Anxiety, Diabetes, Depression, HADS, mHADS

Introduction

Patients with diabetes are almost twice likely to suffer from depression and anxiety compared to general population. An estimated 43 million people with diabetes suffer from depression, making it a leading cause of disability [1, 5]. There can be many consequences in the patient's life from these symptoms, and emotional problems can influence patient adherence to treatment recommendations [4]. This will lead to poor glycaemic control and worsened quality of life, along with higher healthcare costs [2, 3]. Depression, anxiety and diabetes are the result of deregulated and excessive activity of the hypothalamic pituitary-adrenal axis[2].Furthermore, chronic stress causes immunological dysfunction

either directly or indirectly via the HPA axis or the SNS, resulting in an increase in the production of inflammatory cytokines. Inflammatory cytokines at high concentrations interfere with the normal functioning of pancreatic -cells, causing insulin resistance and thereby promoting the emergence of type 2 DM [8]. Although psychological and mental disorders are common in persons with diabetes, they are seldom detected or addressed, causing damage to the patients.[12]Both diabetes and depression have recently been linked to an increased risk of early morbidity and death, and when both disorders coexist, the risk of comorbidities, complications, patient suffering, and related expenses increases. As a result, determining the diagnoses of anxiety and depression in diabetes patients is vital. [13].

The degree of depression and associated risk variables differed between study regions, study designs, study populations, time periods, and measuring methodologies, according to evidence from the literature. As a result, properly measuring the potential public health consequences and medical care for depression in the diabetic population is challenging [11]. The Hospital Anxiety and Depression Scale (HADS) was a screening tool developed by Zigmond and Snaith about 30 years ago as a tool to measure depression and anxiety among a general medical population. The goal of the current study was to analyse the prevalence and association of depression and anxiety in diabetic patients and to create a modified hospital anxiety and depression scale (HADS) specifically for the Southeast Asian diabetic population. At present there are no studies that focuses on the development of a scale that can be applied specifically for diabetic patients. In this study we chose to modify HADS because of its simplicity and reliability. Also both anxiety and depression can be screened simultaneously.

Subjects And Methods:

A prospective, cross-sectional study conducted in a tertiary care centre among patients receiving treatment for type 2 diabetes mellitus for a period of 6 months. The total number of patients who were enrolled in the study was 500 and all of them were newly or previously diagnosed with type 2 diabetes mellitus. The Inclusion Criteria included those patients belonging to the age of 18 years and above with controlled or uncontrolled Type 2 Diabetes Mellitus and patients who were willing to give consent and able to understand the questions in the questionnaires. On the other hand, the study excluded all patients with dementia, endocrinopathies, head injuries, neurological disorders, carcinomas and patients who underwent recent surgeries and also pregnant and lactating women as well as patients on steroids and psychotropics/neuroleptics and also patients with intellectual disabilities.

In the analysis categorical variables were presented using frequency, percentage while continuous variables were presented using mean and standard deviation. Chi Square test was used to find the association of categorical variables whereas Mann Whitney U test and Kruskal-Wallis test was used for comparing means and P value.Cronbach's alpha is used check the reliability of the questionnaire (mHADS).

Instruments

Modified Hospital Anxiety and Depression Scale(mHADS)

The(mHADS) is very similar to the Hospital Anxiety and Depression Scale. This scale is more rapid and the screening can be completed within 5-10 minutes. The scale will cover the food pattern after diabetes, family support, health issues and working potential of the individual patients which are notable contributing factors for the development of depression and anxiety in diabetic patients. Modified questions are directly related to diabetes. The internal consistency of the questionnaire was evaluated using Cronbachs's alpha test.

Results:

The study was conducted in 500 diabetic patients who attended the outpatient department of a tertiary care hospital. General characteristics and clinical characteristics are given in table 1. The mean age group was found to be 62.87±11.62 and most of them were males and alcoholics. The study findings indicate that depression and anxiety were more prevalent in adults with T2D when screened with the modified HAD scale. The modified questions were directly related to diabetes. Analysis showed that majority of the males who belonged to the age group of 61-80 years, patients with a history of alcoholism and those with a lower BMI had severe depression. However, Anxiety was more prevalent in females of

Volume 6, Issue 3; May-June 2023; Page No 406-416

41-60 years of age. Besides, patients who were underweight or those with a history of smoking and were found to be severely anxious.

Table 1.

Table 2.

ASSOCIATION OF DEPRESSION AND ANXIETY IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Chi square test was used to find the association. The p value was <0.05, so it is found that there is an association between age group & depression and anxiety. Mann-Whitney U test was used to compare the means of lab parameters and levels of HADS for anxiety and depression. All of them were found to be statistically significant.

Table 3.

Reliability Analysis

Cronbach's alpha is a convenient test used to estimate the reliability, or internal consistency, of a composite score. Since the resulted Cronbach's Alpha in the both the cases were more than 0.7, it can be concluded that the reliability of the questionnaire is acceptable and shows an excellent reliability of this tool.

Table 4.

Modified Hospital Anxiety and Depression Scale (HADS) for diabetes

The HADS was developed to detect the states of anxiety and depression in hospitalised patients. It contains 14 categories that asscess symptoms on a scale of 0-3 with several reverse-scored items on each subscale.

This is a self modified version of HADS specifically designed to assess these symptoms particularly in the Diabetes population. This was designed based on the data collected from patients and input from our guides and peers.

Figure 1.

Illustrations

Tables

Table 1. General characteristics of the population.

Age group	**Frequency (%)**
Mean±SD	62.87±11.62
Median(IQR)	64(56-70)
21-40	41(4.1)
41-60	329(32.9)
61-80	583(58.3)
81-100	47(4.7)
Gender	
Male	617(61.7)
Female	383(38.3)
Social history	
Non smoker/ Non alcoholic	402(40.2)
Alcoholic	550(55)
Smoker	450(45)
BMI	

Volume 6, Issue 3; May-June 2023; Page No 406-416

Underweight	19(1.9)
Normal	369(36.9)
Overweight	439(43.9)
Obese	173(17.3)
FBS	
Mean ± SD	148.52±52.91
Median (IQR)	140(114-176)
PPBS	
Mean ± SD	195.93±86.10
Median (IQR)	181(156-213)
RBS	
Mean ± SD	224±67.79
Median (IQR)	204.50(185-267)
HbA1C	
Mean ± SD	8.44±1.82
Median (IQR)	8.2(7.1-9.9)

Table 2. Prevalence of depression and in diabetic patients.

	mHADSfor depression		**mHADSfor anxiety**	
	Borderline abnormal	**Abnormal**	**Borderline abnormal**	**Abnormal**
Age group				
21-40	2(7.7)	24(92.3)	3(11.5)	23(88.5)
41-60	2(1.2)	166(98.8)	4(2.4)	164(97.6)
61-80	6(2.1)	279(97.9)	7(2.5)	278(97.5)
81-100	3(14.3)	18(85.7)	0(0)	278(97.5)
Gender				
Male	7(2.3)	298(97.7)	10(3.3)	295(96.7)
Female	6(3.1)	189(96.9)	4(2.1)	191(97.9)
Social history				
Non smoker	6(3.1)	185(96.9)	5(2.6)	186(97.4)
Alcoholic	7(2.4)	286(97.6)	9(3.07)	284(96.93)
Smoker	6(2.7)	219(97.3)	7(3.1)	218(96.9)
BMI				
Underweight	0(0)	11(100)	0(0)	11(100)

Volume 6, Issue 3; May-June 2023; Page No 406-416

Normal	4(2.3)	172(97.7)	6(3.4)	170(96.6)
Overweight	7(3)	223(97)	5(2.2)	225(97.8)
Obese	2(2.4)	81(97.6)	3(3.6)	80(96.4)

Table 3. Comparison of HADS scale with various demographic variables and lab parameters

	mHADS for depression			**mHADS for anxiety**		
	Borderline abnormal	**Abnormal**	**P value**	**Borderline abnormal**	**Abnormal**	**P value**
Age group						
21-40	2(7.7)	24(92.3)		3(11.5)	23(88.5)	
41-60	2(1.2)	166(98.8)	0.001*	4(2.4)	164(97.6)	0.043*
61-80	6(2.1)	279(97.9)		7(2.5)	278(97.5)	
81-100	3(14.3)	18(85.7)		0(0)	21(100)	
Gender						
Male	7(2.3)	298(97.7)	0.592	10(3.3)	295(96.7)	0.417
Female	6(3.1)	189(96.9)		4(2.1)	191(97.9)	
BMI						
Underweight	0(0)	11(100)		0(0)	11(100)	
Normal	4(2.3)	172(97.7)	0.906	6(3.4)	170(96.6)	0.779
Overweight	7(3)	223(97)		5(2.2)	225(97.8)	
Obese	2(2.4)	81(97.6)		3(3.6)	80(96.4)	
FBS						
Mean±SD	104.46±19.59	150.97±46.41	<0.001*	124±54.20	150.51±46.10	0.005*
PPBS						
Mean±SD	158.85±61.29	207.77±102.55	0.001*	173.21±70.42	207.46±102.61	0.007*
RBS						
Mean±SD	175.15±57.82	229.06±59.81	0.001*	183.21±58.03	228.93±59.95	0.004*
HbA1C						
Mean±SD	5.81±0.57	8.49±1.84	<0.001*	5.92±0.53	8.50±1.84	<0.001*

Table 4. Reliability of the questionnaire.

	Frequency	**Percentage**
Valid Sample	10	100

Volume 6, Issue 3; May-June 2023; Page No 406-416

Eliminated	0	0
Total	10	100
Reliability	**Cronbach's alpha**	**Frequency**
Depression scale	0.765	14
Anxiety scale	0.805	14

Figures

Figure 1: Modified Hospital Anxiety and Depression Scale (HADS) for diabetes

Tick the box beside and reply closest one

D	A		D	A	
		I feel tense about diabetes:			**I feel as if I am down after disease:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy after getting diabetes:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen with diabetes:			**I have lost interest in my hobbies:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever

Volume 6, Issue 3; May-June 2023; Page No 406-416

		I can laugh and see the funny side of things like I used too :			**I feel sleepy and tired in doing activites :**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind about diabetes :			**I look forward with enjoyment to things after diabetes:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful as earlier I used too:			**I get sudden feelings of panic about the medication and the way others treat me:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed with my family after getting diabetes:			**I can enjoy a good book or TV program or travel after getting diabetes:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring for modified HADS scale for diabetes:

Total score: Depression (D) _____ Anxiety (A) _____

Normal	Borderline abnormal	Abnormal
0-7	8-10	11-21

Volume 6, Issue 3; May-June 2023; Page No 406-416

Discussion:

This study was conducted with the aim to prepare a depression and anxiety scale specific for diabetic patients. The scales currently available are not specific for diabetes related anxiety and depression. This study analyses the prevalence and association of depression and anxiety in type 2 DM and it was done by screening the patients with validated and modified HADS. Looking at the other studies, it is found that the existence of untreated anxiety and depression among diabetics is a cause for concern because these symptoms can delay the start of therapy, exacerbate patient frustration, and have a negative impact on clinical outcomes.

Nianquan Sun et al. did a cross-sectional community-based exploratory study in which they analysed the Self-Rating Anxiety and Depression Scales in men and women with type 2 diabetes aged 18–84 years and discovered that diabetics aged 30–60 years had greater depression symptoms [17]. Emotional anguish, chronic stress, bad living conditions, economic pressure, financial burden, broken relationships, tension generated by their different vocations and commitments, a lack of work, and so on can all contribute to this. Middle age is a stage of life in which people must juggle multiple occupations and responsibilities in areas such as work and family. They may feel more burdened and under stress as a result of their societal responsibilities, and life's commitments have a considerable impact on them. Sleep problems, social isolation, loneliness, a lack of exercise, unwanted stress, various diseases and their obstacles, or the fear of dying, among other things, all contribute to depressive symptoms as individual's age[18].

In a cross-sectional study, CarolaDeischinge et al. investigated the impact of diabetes mellitus on the gender gap in major depressive disorder (MDD) over the course of a human lifetime. According to their findings, having diabetes and being a woman, both increase the risks of being diagnosed with major depressive disorder (MDD) and/or being underdiagnosed with depression due to biological factors and the psychological cost of the illness [14]. When looked at the gender distribution it was observed that both males and females suffer from depression as a result of their diabetes. In addition, when compared to the female population, males have mildly greater levels of depression. This discrepancy could be attributed to socio-cultural variations, gender norms, or problem-solving strategies used by males and females in various study circumstances. They do not discuss their concerns with others since they are men, and they worry alone. As a result, people may be denied counselling or other forms of support that could help them with their sickness treatment. For men, the combination of metabolic, behavioural, and psychological risk factors appears to be more harmful [9,10].

Depression and anxiety have been found to be more common among alcoholic patients as a result of factors including job loss or unemployment, financial troubles, and broken relationships, all of which can contribute to increased alcohol consumption. When it comes to smokers or other substance abusers, nicotine actually encourages the brain to down regulate dopamine production, or to put it another way, the brain begins to make less dopamine as a result of nicotine consumption, which affects the brain and hypothalamus, making the person feel even more depressed. The remaining percent of non-smokers and alcoholics reported depression and anxiety are due to the stress generated by their many occupations and obligations, a lack of work, sex discrimination, and other situations that lead to women's poor mental health, such as gender-based violence. [16]

Chronic stress, poor living conditions, financial strain, single status, social isolation, substance abuse, alcoholism, death of loved ones, conflict, age, vulnerability, financial difficulties, failed relationships, and stress caused by their various jobs and commitments can all contribute to poor appetite and depression. Furthermore, it has been claimed that metabolic changes in patients with diabetes and obesity may exacerbate depression severity. The increased prevalence of depression in the obese and overweight population could be attributed to the fact that depressed people are more prone to living sedentary lifestyles, being physically inactive, smoking, and eating a high-fat diet, all of which contribute to poor diabetic management and clinical outcomes.[14]

Coming to this study the HAD scale was used to assess anxiety and discovered that people in the age group 41–60 had a high rate of anxiety due to a

Volume 6, Issue 3; May-June 2023; Page No 406-416

variety of social and economic issues such as chronic stress, poor living conditions, financial hardship, and divorced or separated people. Sleep problems, social isolation, loneliness, a lack of exercise, unwanted stress, various diseases and their obstacles, or the fear of death, among other things, all contribute to depressive symptoms as individuals age.[7]

In their study of the prevalence and causes of anxiety and depression, as well as their impact on glycemic control in type 2 diabetes patients, Nianquan Sunet.al and colleagues discovered a link between being a woman and experiencing anxiety or depression symptoms [17]. In this study, it was observed that females have a mildly heightened level of anxiety when compared to males. Women's mental health is also harmed by the stress caused by their different jobs and commitments, a lack of work, sex discrimination, and other factors that contribute to their poor mental health, such as domestic violence. [11, 19]. Psychosocial factors have been associated with anxiety, melancholy, stress, and diabetes-related suffering. Emotional discomfort was negatively linked to increasing social support and coping techniques were linked to social well-being, psychological health, and physical health outcomes. Older people, indigenous people, separated or divorced people, bereaved people with a low primary education, and obese patients were all shown to be depressed among the diabetes population. [1, 5].

Chronic stress, poor living conditions, financial strain, unmarried status, social isolation, substance abuse, alcoholism, death of loved ones, conflict, age, vulnerability, financial difficulties, failed relationships, stress caused by their various jobs and commitments, a lack of work, sex discrimination, differences in culture and religion, the burden of chronic disease and its management, lower educational status, social constraints, and so on are all possible causes. All of these factors can wreak havoc on one's quality of life.[13, 15, 19]

Findings suggests that boosting the psychological support networks of people with DM can help them feel less anxious and improve their quality of life. Routine screening of people with type 2 diabetes should be encouraged to enhance mental health and improve quality of life, given the high prevalence of depression and diabetes distress. Physical activity has a protective effect on diabetic patients with depression and anxiety. Early detection and treatment of psychological issues in patients with type 2 diabetes may help to alleviate depressive feelings [6, 12, 15].

After the analysis, it was found that majority of the diabetic patients are suffering from depression and anxiety and there is an increased chance for the development of these psychological disorders in the upcoming future as diabetes has become one of the lifestyle disorders. In the light of this fact, a scale specifically designed to diagnose depression and anxiety in diabetic patients is necessary. The modified HADS has the benefit of assessing both anxiety and depression in type 2 DM patients. The scale is more rapid and the screening can be completed within 5-10 minutes. The scale will cover the food pattern after diabetes, family support, health issues and working potential of the individual patients which are notable contributing factors for the development of depression and anxiety in diabetic patients and are poorly screened with the already existing HADS. Using a scale developed only for screening depression and anxiety in diabetic patients will help in accurate diagnosis. The study recommends frequent screening to minimise both depression and anxiety in diabetic populations in order to improve treatment results due to the rising prevalence of depression and anxiety in the South East population.The study's shortcomings show that multi-centered research could produce more reliable results.

The presence of undiagnosed anxiety and depression among persons with diabetes is a matter of concern since these symptoms will affect the initiation of treatment and also cause frustration to build up in patients and results in poor clinical outcomes.The modified HADS is reliable in the South Indian diabetic population understandabout depression and anxiety and study also found that diabetes patients had a high prevalence of both psychiatric conditions.

Acknowledgements

We are deeply indebted to the people who have helped us in the conduction and smooth completion of this research work.

We are grateful to the Management and Ethics Committee of Caritas hospital for permitting us to conduct this study in their esteemed Hospital.

Volume 6, Issue 3; May-June 2023; Page No 406-416

It is our privilege to work under the guidance of Dr.Sreenath R who led us through the topic and hospital procedures.

Our sincere gratitude to our Professor Mrs Meby Susan Mathew who helped us about the thesis preparation and writing.

Last but not the least our parents, family and friends for all the support that they have given each of us.

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Volume 6, Issue 3; May-June 2023; Page No 406-416

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Volume 6, Issue 3; May-June 2023; Page No 406-416