

Hamiltons Depression Rating among Exam Going Students and Their Oral Health Status – A Compendium

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Abstract:-Depression is a common mental disorder. Globally, more than 264 million people of all ages suffer from depression. World Health Organization has predicted that by 2020 depression will become the second leading cause of disease worldwide. While physical pain and emotional pain are different, there is research that suggests that both types of pain may share some neurological similarities. As oral cavity is the index of systemic health, depression might show some of the characteristics feature in oral cavity. In this literature, we appraise the effects of depression on oral cavity of the individual.

Keywords:- Depression, Hamilton's Criteria, Depressed Individuals, Oral Health Status.

I. INTRODUCTION

Depression is a prevalent mental illness that occurs with dejection, lack of interest or enjoyment, feelings of guilt or sorrow. Self-worth is low, sleep or appetite is disrupted, capacity is low and impoverished focus. Depression typically happens due to multiple causes. It may occur due to adverse events in life, such as the loss of important people, artefacts, relationship, and also because of no obvious cause^[1]. Depression is a pervasive and intense medical condition that it has a negative effect on how you feel, how you think and how you behave. Depression, in contrast, plays a pivotal role in syndromes with chronic pain, as it can exacerbate perceived pain and diminish an individual's capacity to withstand pain^[2]. A common but severe mood disorder is depression (major depressive disorder or clinical depression). Recent research studies shows that depression is triggered by a variety of variables that are genetic, biological, environmental, and psychological. It can occur at any age, but mostly starts in adulthood. Depression is now known to occur also in children and teenagers. Many chronic mood and anxiety disorders in adults start with high levels of children's anxiety. Depression among students is becoming one of the major health problems. Pursuant to the prevalence, depression is estimated to be 1.5% by National Health Survey carried out by NIMHANS and 2.2% for students who have suffered from Depression at some point in the past. There

depression among male students is the highest in the 18-22 age groups and among those in urban areas 1.7% relative to rural areas 1%^[3].

The Hamilton Depression Rating Scale (HAM-D) is the most extensively used clinician-rated scale for the evaluation of the seriousness of depression in patients who already have a depressive condition diagnosed. The first one of the HAM-D variant was initially published by Max Hamilton in 1960, consisting of 21 things, the HAM—D21. The number of citations given in this version of the Scopus, the scale reaches 21,000^[4]. Although HAM-D has been referred to as the "gold standard" for depression calculation, severity, scoring difficulties and psychometric limitations limit the measure^[5]. However Hamilton himself recommended to use only the first 17 objects since the last 4 symptoms of HAM-D21 (i.e. diurnal variation, Depersonalization / derealisation, paranoid, obsession / compulsive symptoms) were not considered as part of the illness, or they were relatively uncommon, or they were not considered characteristics associated with severity of depression. Over the years, a variety of amendments to the scale have been proposed^[4].

Until recently, the causes of oral health problems have received less attention, as these are seldom potentially fatal. Evidence suggests that the oral health affects the mental health of the patient's wellbeing, improving one's self appreciation, attitude, and satisfaction with health services and also the effect on their social lives and quality of life. However, self-esteem and disturbed mood can also be predicted that would affect oral health which can be interpreted by their Oral Health Related Quality of Life (OHRQoL). There is, hence, a complicated circular relationship between psychological variables (i.e. Self-esteem, mood disrupted) and OHRQoL. Because the characteristics of personality and self appreciation directly affects each other and personality characteristics are important for OHRQoL^[6].

II. AIMS AND OBJECTIVES OF THIS STUDY

1. To determine the elements accountable for depression and evaluate the extent of depression using Hamilton's criteria.
2. Ill effects of depression on their daily activities.
3. Their correlation of oral health status in exam going paramedical students.

III. MATERIALS AND METHODOLOGY

This survey study was conducted randomly among 100 exam going paramedical students in a reputed Institution, in CHENNAI, TAMILNADU to determine the elements accountable for depression and evaluate the extent of depression using Hamilton's Criteria and their ill effects on their daily activities and correlation with their oral health. The questionnaires were circulated around the month of

January 2020 and to clinch the participation of the students, the questionnaire were distributed and collected through PAPER – PENCIL method. The purpose of the study was explained to the participants clearly and it took around two months to cluster the out righted data. The questionnaire included predesigned HAMILTONS DEPRESSION CRITERIA (1-17) [HAM-D 17] and customised ORAL HEALTH STATUS questions. The moderate groups of people were taken into consideration for this study.

IV. DATA COLLECTION:

➤ HAMILTONS DEPRESSION RATING SCALE (HAM-D)

Hamilton's depression rating self report questionnaire was given to determine the severity of symptoms over a period of past two weeks. Score of the scale ranging from 0 TO 4 was used under each description.

S, NO	HAMILTONS CRITERIA	SCALE
1	DEPRESSED MOOD (SADNESS,HOPELESS)	0-4
2	FEELINGS OF GUILT	0-4
3	SUICIDAL THOUGHT	0-4
4	INSOMNIA (EARLY IN THE NIGHT)	0-2
5	INSOMNIA (MIDDLE OF THE NIGHT)	0-2
6	INSOMNIA(EARLY IN THE MORNING)	0-2
7	WORK AND ACTIVITIES	0-4
8	RETARDATION	0-4
9	AGITATION	0-4
10	ANXIETY PSYCHIC	0-4
11	ANXIETY SOMATIC	0-4
12	SOMATIC SYMPTOMS OF GASTROINTESTINAL	0-2
13	SOMATIC SYMPTOMS OF GENERAL	0-2
14	GENITAL SYMPTOMS	0-2
15	HYPOCHONDRIASIS	0-4
16	LOSS OF WEIGHT	0-3
17	INSIGHT	0-2

Table 1 :- Hamiltons Criteria

➤ INTERPRETATION

The individual score of Hamilton criteria for each question were summed up to obtain the severity of depression scale rating, ranging from 0-22.

➤ HAMILTONS SEVERITY RATINGS

Depending on the overall score range for HAM-D 17 the severity ranging for depression is given as follows;

RANGE	SEVERITY
0-7	NORMAL
8-13	MILD
14-18	MODERATE
19-22	SEVERE
GREATER THAN 22	VERY SEVERE

Table 2 :- Hamiltons Depression Rating Scale

➤ ORAL HEALTH STATUS AMONG INDIVIDUALS IN A DEPERESSED STATE

As the oral health status and psychological variables are correlated, it is important to measure the oral health status in depressed individuals. The oral health status is provided with customised score ranging from 0-8 depending on the severity.

RANGE	ORAL HEALTH SCORE
0.0 - 1.0	NORMAL
1.1 - 2.0	MILD
2.1 - 3.0	MODERATE
3.1 - 4.0	SEVERE
4.1 - 6.0	VERY SEVERE

Table 3 :- Oral Health Score

➤ **ETHICAL CONSIDERATION AND CONFIDENTIALTY:**

Each subject was explained clearly about the study and informed consent was obtained and the confidentiality of the subject was maintained.

➤ **DEPRESSION RATE AMONG 100 PARTICIPANTS USING HAMILTONS CRITERIA**

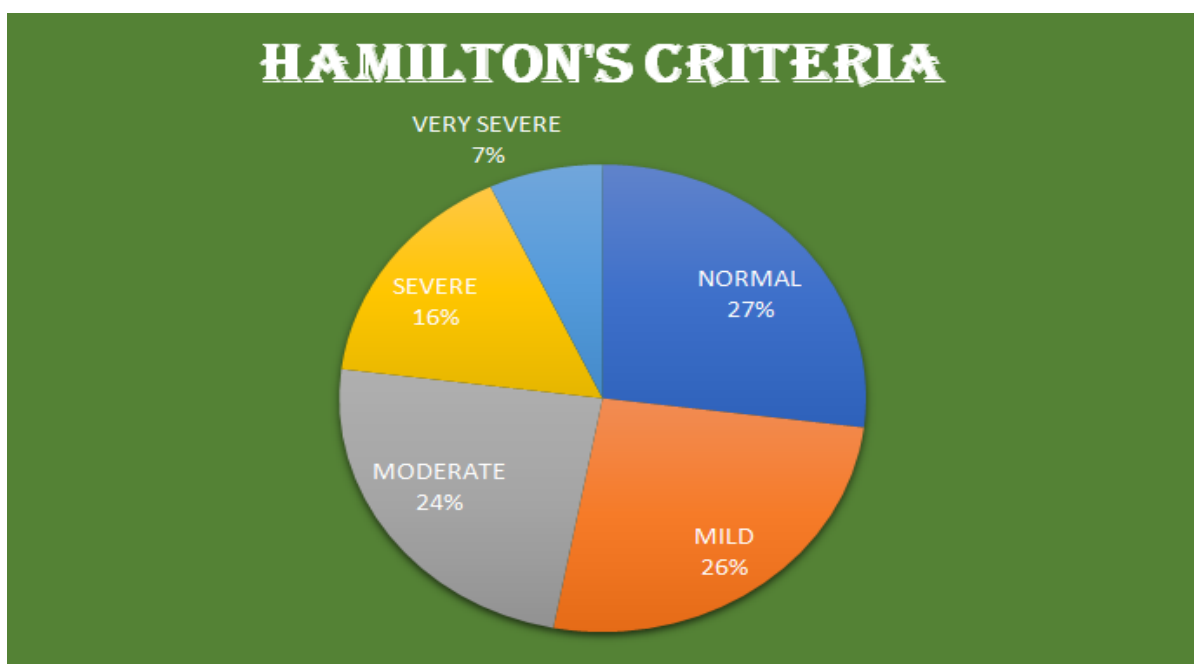


Fig 1 :- Hamiltons Score Among 100 Participants

Among the 100 students who participated in this survey, based on Hamilton’s scale 27% were found to be normal, 26% in mild depression, 24% in moderate depression, 16% severe and 7% were found to be in very severe.

➤ **ORAL SCORE AMONG 100 PARTICIPANTS**

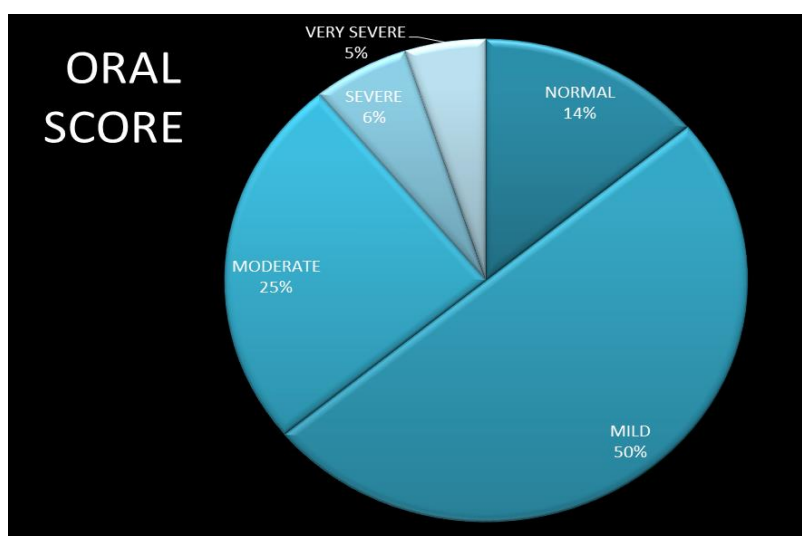


Fig 2 :- Oral Score Among 100 Participants

Among 100 students the oral score was Normal for 14%, Mild for 50%, Moderate for 25%, Severe for 6% and Very severe for 5% of participants.

➤ **MODERATE GROUPS**

Our study was solely focused on the moderate group of people out of 100 participants who are suffering from depression during the exam time depending on the Hamilton's Rating criteria and their oral health status was given importance. In those 100, 24% of participants are in moderately depressed group.

➤ **STATISTICAL ANALYSIS**

S.NO	QUESTION	OPTIONS	FREQUENCY	PERCENTAGE
1.	DEPRESSED MOOD	Absent.	2	8.3
		These feeling states indicated only on questioning.	2	8.3
		These feeling states spontaneously reported verbally.	3	12.5
		Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep.	16	66.7
		Patient reports virtually only these feeling states in his/her spontaneous verbal and non-verbal communication	1	4.2
2.	FEELING OF GUILT	Absent.	0	0
		Self reproach feels he/she has let people down	10	41.7
		Ideas of guilt or rumination over past errors or sinful deeds	11	45.8
		Present illness is a punishment. Delusions of guilt	2	8.3
		Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.	1	4.2
3.	SUICIDE	Absent.	23	95.8
		Feels life is not worth living	1	4.2
		Wishes he/she were dead or any thoughts of possible death to self.	0	0
		Ideas or gestures of suicide	0	0
		Attempts at suicide	0	0
4.	INSOMNIA(EARLY IN NIGHT)	No difficulty falling asleep.	13	54.2
		Complains of occasional difficulty falling asleep, i.e. more than 1/2 hour	9	37.5
		Complains of nightly difficulty falling asleep	2	8.3
5.	INSOMNIA(MID OF NIGHT)	No difficulty.	18	75.0
		Patient complains of being restless and disturbed during the night.	3	12.5
		Waking during the night	3	12.5
6.	INSOMNIA(EARLY IN MORNING)	No difficulty.	15	62.5
		Waking in early hours of the morning but goes back to sleep.	7	29.2
		Unable to fall asleep again if he/she gets out of bed.	2	8.3
7.	WORK AND ACTIVITIES	No difficulty.	4	16.7
		Thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies.	2	8.3
		Loss of interest in activity, hobbies or work – either directly reported by the patient or indirect in listlessness, indecision and vacillation (feels he/she has to push self to work or activities).	15	62.5
		Decrease in actual time spent in activities or decrease in productivity	0	0

		Stopped working because of present illness. patient engages in no activities except routine chores, or if patient fails to perform routine chores	3	12.5
8.	RETARDATION	Normal speech and thought.	15	62.5
		Slight retardation during the interview.	4	16.7
		Obvious retardation during the interview.	3	12.5
		Interview difficult.	1	4.2
		Complete stupor	1	4.2
9.	AGITATION	None.	6	25.0
		Fidgetiness.	4	16.7
		Playing with hands, hair, etc.	6	25.0
		Moving about, can't sit still.	6	25.0
		Hand wringing, nail biting, hair-pulling, biting of lips	2	8.3
10.	ANXIETY PSYCHIC	No difficulty.	4	16.7
		Subjective tension and irritability.	5	20.8
		Worrying about minor matters.	8	33.3
		Apprehensive attitude apparent in face or speech.	3	12.5
		Fears expressed without questioning	4	16.7
11.	ANXIETY SOMATIC	Absent.	7	29.2
		Mild.	11	45.8
		Moderate.	6	25.0
		Severe.	0	0
		Incapacitating.	0	0
12.	SOMATIC GASTROINTESTINAL	None.	16	66.7
		Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen.	5	20.8
		Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or medication for gastro-intestinal symptoms.	3	12.5
13.	SOMATIC GENERAL	None.	14	58.3
		Heaviness in limbs, back or head. Backaches, headaches, muscle aches. Loss of energy and fatigability.	10	41.7
		Any clear-cut symptom rates 2	0	0
14.	GENITAL	Absent	20	83.3
		Mild	4	16.7
		Severe	0	0
15.	HYPOCHONDRIASIS	Not present.	13	54.2
		Self-absorption (bodily).	8	33.3
		Preoccupation with health.	2	8.3
		Frequent complaints, requests for help, etc.	0	0
		Hypochondrial delusions	1	4.2
16.	LOSS OF WEIGHT	No weight loss. Less than 1 lb weight loss in week.	15	62.5
		Probable weight loss or Greater than 1 lb weight loss associated with in week.	1	4.2
		Greater than 2 lb weight loss in week	6	25.0
		Not assessed	2	8.3
17.	INSIGHT	Acknowledges being depressed and ill.	10	41.7
		Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.	8	33.3
		Denies being ill at all.	6	25.0

Table 4 : Observation Of Hamiltons Criteria In Moderate Group

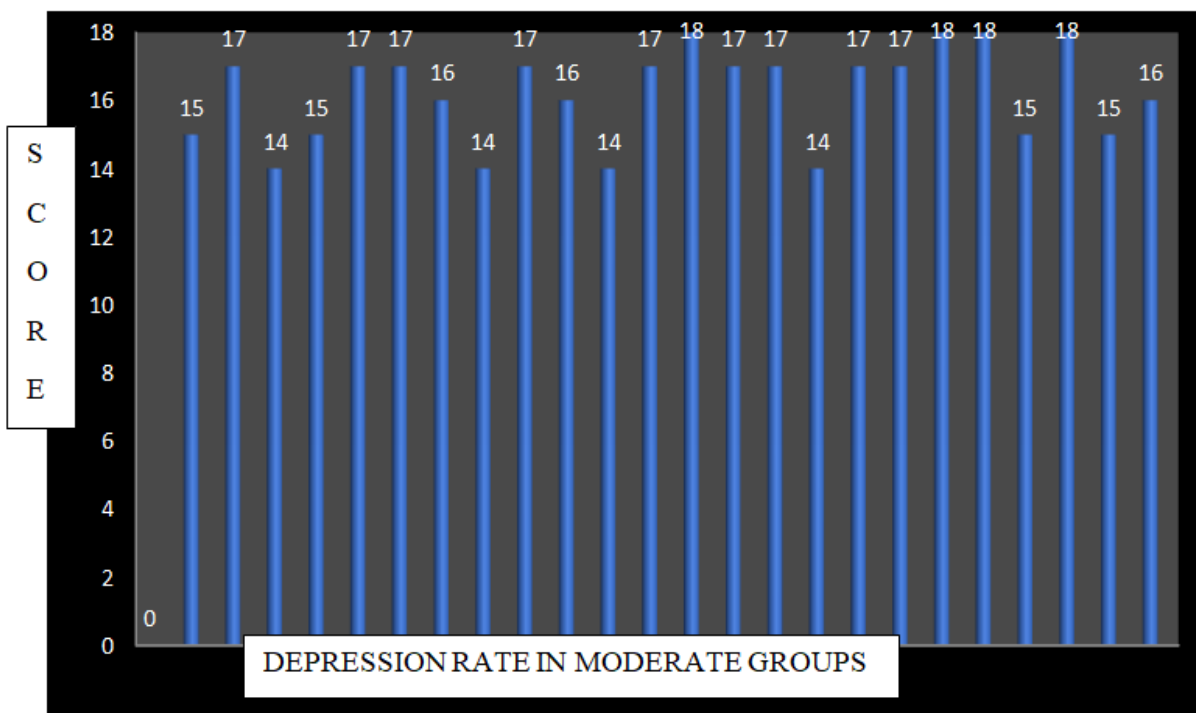


Fig 3 :- Depression Rate Among Moderate Group

S.NO	QUESTION	OPTION	FREQUENCY	PERCENTAGE
18.	FREQUENCY OF BRUSHING	Twice daily	5	20.8
		Once daily	18	75.0
		Nil	1	4.2
19.	FREQUENCY OF MOUTH ULCERS	No Ulcer Present	18	75.0
		Once In A Month	5	20.8
		More Than One Time	1	4.2
20.	TIME OF BRUSHING IN MINUTES	Less than two minutes	7	29.2
		Two to five minutes	15	62.5
		Five to ten minutes	2	8.3
21.	EXPERIENCE OF BLEEDING DURING BRUSHING	Never	11	45.8
		Rarely	11	45.8
		Often	2	8.3
22.	USE OF MOUTHWASH	Never	17	70.8
		Often	3	12.5
		Regularly	4	16.7
23.	EXPERIENCE OR FEELING OF BAD BREATH OR SMELL	Never	22	91.7
		After food	0	0
		During tension or work	2	8.3
24.	TEMPOROMANDIBULAR JOINT PAIN	Never	16	66.7
		Sometimes	8	33.3
		Often	0	0

Table 5 :- Observation of Oral Criteria

ORAL HEALTH STATUS OF MODERATE GROUP PEOPLE

Among the moderate group, the depression rate varied depending on their individuality and their oral health status was also varied among each participant in each group which is as follows:

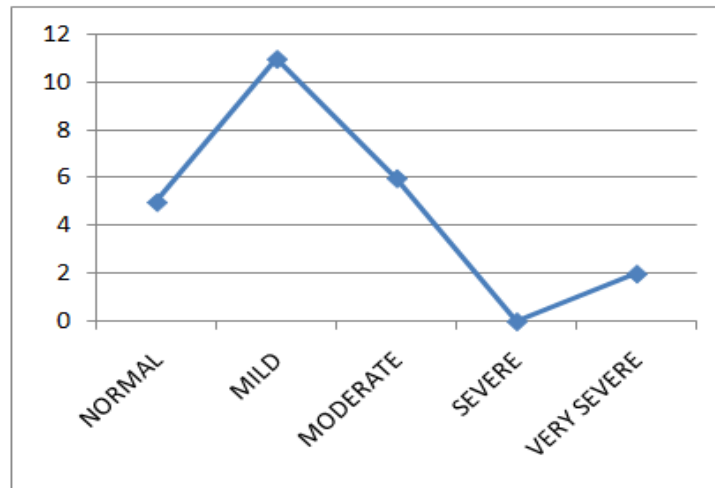


Fig 4 :- Oral Status Among Moderate Group

V. DISCUSSION

Depression is a widespread mental condition and in the future it will be one of the major causes of mental illness. In addition, depression also comes with symptoms of anxiety and may lead to suicide at its worst^[7]. Adolescents, especially college-going students, suffer from depression and anxiety at higher rates as there are ample stressors and impulses. Emotional, behavioural, sexual, financial, academic and social transitions and actions to discover one's psychosocial identity^[8].

Among college students, mental health issues are very common. Undergraduate students, attending college corresponds to a tough time, as they begin college after graduating high school and are generally younger, rely on financial support from parents, and do not work or work part-time. Therefore, these students will have to face the challenge of taking on more adult-like commitments in addition to stress associated with academic load without having yet mastered the abilities and cognitive maturity of adulthood^[9].

The prevalence rate of depression among students who participated in this current survey is 63 percent, while 7 to 9 percent in the study conducted by Eisenberg D et al. on variance between student subgroups and across campuses^[9]. 8.30 percent of students in the study conducted by Shah T, 59.3 percent in a study conducted by Singh M, Goel NK et al. and 57 percent in a study conducted in Jhansi, Uttar Pradesh, in the year 2016 and whereas a study carried out in Karnataka in 2012 depicted an overall prevalence of depression to be 71.25 percent^[8].

In our sample, among those depressed people, 26 percent were in mild depression, 24 percent in moderate, 16 percent extreme and 7 percent in very severe, while most 80 percent had mild and moderate degree of depression and 7.5 percent and 6.7 percent in the study conducted by Shah et al., respectively, were in severe and profound depression. The study conducted in Jhansi, UP, 2016, a majority of 73 percent had mild to moderate rates of depression and just 3 percent of people had incredibly severe depression^[8]. 24% of

participants in our survey were in a moderate group, while 7% were in a moderately depressed group in a study performed by Rani Mohanraj et al. on the prevalence of depressive symptoms in urban adolescents in southern India in 2010^[10].

The percentages, however smaller, are of serious importance which has to consider their true impact on the quality of life of the students and their future consequences. This highlights that the recognition and control of depression as early as possible is an essential and extreme necessity. There are various significant factors related to depression in adolescents in India, including gender, low level of parental monitoring, loneliness, critique of escalating adolescent-parent conflict, socioeconomic status. In addition, parental influence, alleged criticism by peers, parents and teachers, pressure for academic achievement, lack of self confidence, lack of university support, nepotism, relationships, and unmatched deadlines predict a rise in depressive symptoms^[8].

35 percent had suicidal thoughts conducted by Zivin K, et al. on the persistence of mental illnesses and needs in a college student population^[9], while in our study about 95 percent of them had no knowledge of suicide. In our study, due to depression, 16.7 percent of the respondents in moderate group had work difficulty and 18.4 percent had work difficulty in the moderate group which was in accordance with a study by Rani Mohanraj et al^[10]. Sleep disorders were identified in 7 percent and 8 percent loss of libido in the study by Rani Mohanraj et al^[10]. In our study, about 55-70 percent suffered from insomnia in early, midnight or early morning and 16.7 percent from mild genital disturbances.

The orofacial area is most often involved in psychiatric disorders. A typical feature of the oral mucosa is that it is very receptive to emotional factors such as stress, anxiety, and depression. Oral mucosal diseases may also evolve as direct manifestations of feelings or as an indirect effect of psychological changes. Depression is correlated with numerous oral diseases, such as oral lichen planus, recurrent aphthous stomatitis,^[1] of which 20.8 percent of participants

in the current research in the moderate category had frequent ulcers in a month, while the prevalence of RAS in depression patients was 4.02 percent in the study conducted by Suresh et al. in 2015 and 1.2 percent in a cross-sectional study by Mumcu G in Turkey population^[11].

Oral diseases can also be worsened by psychological disruptions. Studies have shown that oral diseases often endure remission and exacerbation cycles that can be linked with the emotional state of patients by Schiavone et al., 2012. Temporomandibular joint dysfunction is often found in them and has been suspected to be elevated in stress induced individuals^[1], and in our current research, 33.3 percent of the moderate group observed temporomandibular joint pain.

As a cause of systemic inflammation, poor dental health is well known. There is now ample proof that an inflammatory condition is indeed depression. This High, state of prevalence is preceded by chronic, low-grade inflammation, indicated by Increased levels of proteins in the acute phase, such as and C-reactive protein (CRP), Pro-inflammatory cytokines, including tumour necrosis factor and interleukins. Data from the large-scale, longitudinal studies have shown that high inflammatory markers, such as high sensitivity CRP exposure, raises the likelihood of major depressive disorder growth. Although inflammation was not found in this study to affect the relationship between bad oral health and depression, the inflammation marker used in the study of CRP, to detect impact, was not sufficiently sensitive. Although CRP is a valid marker of an inflammatory disorder, we recognise that extreme systemic inflammation is largely mirrored. Indeed, only local inflammation along with systematic factors can constitute dental illness such as periodontitis. Furthermore, CRP increase not only occur with infection, but also occurs with trauma, tissue necrosis, autoimmune diseases and malignancies. Such facts can help clarify our finding, that CRP did not affect the relationship between dental health and depression. Instead, an association in further causes may be clarified between poor dental health and depression^[12].

The results of the analysis conducted by Alkan et al. showed that through a common mechanism, all psychological factors (i.e. depression, anxiety and ADHD) had indirect adverse effects on the periodontal health of the subject. In Arzu Alkan's report, 40.6% brushed their teeth once a day^[13] and about 75% of participants of moderate group in our study brushed their teeth once a day and their oral hygiene was ignored, confirming one of the behavioural symptoms of depression (i.e. inability to engage in physical activities) as physical activity is needed for toothbrushing^[13]. Depression is related to decreased serotonin metabolism, which has been hypothesised to play a role in the assessment of macronutrients, with decreased serotonergic activity contributing to a craving for carbohydrates. Regular consumption of fermentable carbohydrates enhances lactobacilli production, promoting dental caries. In preventing bacterial adherence to tissues, saliva has a major function. Lactobacilli growth may be

favoured by a low salivary pH and flow rate and a low buffering capacity. By having a negative effect on salivary secretion, drugs can also increase the lactobacillus count. Saliva and its elements may influence the growth of salivary lactobacillus. However, decreased flow rate, pH and buffering capacity are not sufficient to explain the association between depressive symptoms and high counts of lactobacillus, even when regulated by confounding factors. Increased cortisol secretion is also associated with depression, which may affect the normal functions of the immune system^[14]. Psychological issues, however, are more predominant in patients with chronic pain and may be the consequence of pain rather than its cause. They tend to be independent of the severity of the symptoms, but seem to be mainly linked to a sustained period of pain and a prolonged history of unsuccessful treatment^[15].

In addition, it is likely that various types of anti-depressant drugs lead to oral health degradation. Well documented side effects include hyposalivation, xerostomia etc. are the manifestations of these drugs. These, though feasible, it may be the case that a bi-directional relationship exists between dental relationships and psychological wellbeing^[13].

VI. LIMITATIONS OF THE STUDY

Since depression is a worldwide disorder, a study conducted within a confined population is not sufficient to conclude its impact among adolescents. Thus, furthermore detailed descriptive study on a larger number of samples might be required to know the real impact of depression.

VII. CONCLUSION

Depression is a mental illness that occurs due to depressed mood, guilty feeling or without any underlying cause. This may be chronic or recurrent and they impairs the lifestyle of the person. The presence and severity of depression slightly influences the oral health status of the people as the systemic and oral health are correlated one way or the other. So the dentist should be aware of the depression and their influences on the oral cavity. This will be helpful in an early diagnosis and could help them lead a better lifestyle.

REFERENCES

- [1]. Datta, Dr Dipayan, and Dr Ramesh Kumar SG. "oral health". *International Journal of Current Research Key words*.
- [2]. Skośkiewicz-Malinowska, Katarzyna, et al. "Oral health condition and occurrence of depression in the elderly." *Medicine* 97.41 (2018).
- [3]. Shrivastava, Ashish, and Don Rajan. "Assessment of Depression, Anxiety and Stress among Students Preparing for Various Competitive Exams."
- [4]. Carrozzino, Danilo, et al. "The Hamilton Rating Scales for Depression: A critical review of clinimetric properties of different versions." *Psychotherapy and Psychosomatics* 89.3 (2020): 133-150.

- [5]. Rohan, Kelly J., et al. "A protocol for the Hamilton Rating Scale for Depression: item scoring rules, rater training, and outcome accuracy with data on its application in a clinical trial." *Journal of affective disorders* 200 (2016): 111-118.
- [6]. Oancea, Roxana, et al. "Influence of depression and self-esteem on oral health-related quality of life in students." *Journal of International Medical Research* 48.2 (2020): 0300060520902615.
- [7]. Ghayas, Sana, et al. "Prevalence and severity of depression among undergraduate students in Karachi, Pakistan: A cross sectional study." *Tropical Journal of Pharmaceutical Research* 13.10 (2014): 1733-1738.
- [8]. Shah T, Pol T. Prevalence of depression and anxiety in college students. *J Mental Health Hum Behav* 2020;25:10-3.
- [9]. Pedrelli, Paola, et al. "College students: mental health problems and treatment considerations." *Academic Psychiatry* 39.5 (2015): 503-511.
- [10]. Mohanraj, Rani, and Karunanidhi Subbaiah. "Prevalence of Depressive Symptoms among Urban Adolescents of South India." *Journal of Indian Association for Child and Adolescent Mental Health* 6.2 (2010): 33-43.
- [11]. Suresh, Kandagal V., et al. "Oral mucosal diseases in anxiety and depression patients: Hospital based observational study from south India." *Journal of clinical and experimental dentistry* 7.1 (2015): e95.
- [12]. O'Neil, Adrienne, et al. "The association between poor dental health and depression: findings from a large-scale, population-based study (the NHANES study)." *General hospital psychiatry* 36.3 (2014): 266-270.
- [13]. Alkan, Arzu, et al. "Relationship between psychological factors and oral health status and behaviours." *Oral Health Prev Dent* 13.4 (2015): 331-9.
- [14]. Anttila, Sirpa S., Matti LE Knuuttila, and Tero K. Sakki. "Depressive symptoms favor abundant growth of salivary lactobacilli." *Psychosomatic medicine* 61.4 (1999): 508-512.
- [15]. Schiavone, Vittorio, et al. "Anxiety, depression, and pain in burning mouth syndrome: first chicken or egg?." *Headache: The Journal of Head and Face Pain* 52.6 (2012): 1019-1025.