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**CLINICAL RELEVANCE**

This research study has strongly highlighted the significance of a proper understanding and knowledge of Temporomandibular Joint, Muscles of mastication and the related significant anatomical muscles; that can play an imperative role for the General Dental Practitioner, Restorative Dental Practitioner, Endodontists as well as an Oral and Maxillofacial Surgeon in the Diagnosis, Case selection and Treatment planning, thereby leading to an excellent patient management since

**“EVALUATION OF FREQUENCY OF ANXIETY AND DEPRESSION AMONG PATIENTS WITH CHRONIC TEMPOROMANDIBULAR DISORDER.”**

**Arfa Baig<sup>1</sup>, Bushra Ghani<sup>2</sup>, Oam Parkash<sup>3</sup>, Lubna Memon<sup>4</sup>, Shoaib Muhammad Chohan<sup>5</sup>, Daud Sultan<sup>6</sup>**

**ABSTRACT:** The Temporomandibular Disorder (TMD) has been considered as one of the most commonest disorder in Pakistan. In this disorder, the patient complains of pain in Temporomandibular joint and associated anatomical muscles. This research study has been performed to evaluate the frequency of Anxiety and Depression in patients with Chronic Temporomandibular Disorder (CTMD). **Objectives:** The objective of this research study is to evaluate the frequency of Anxiety and Depression among patients with Chronic Temporomandibular joint Disorder. **Study Design:** A Cross-sectional Descriptive research study. **Setting:** This research study was conducted in the Department of Oral and Maxillofacial Surgery at Dr. Ishrat-ul-Ebad Khan Institute of Oral and Health Sciences (DIKIOHS), Dow University of Health Sciences and Dr. Ruth K.M. Pfau Civil Hospital, Karachi, Pakistan. **Period:** This research study was conducted for a respective period of 1 year from 1<sup>st</sup> March 2018 to 1<sup>st</sup> March 2019. **Materials and Methods:** A total of 213 patients having persisting pain in Temporomandibular Joint for a time period of more than 6 months were included in this study. A diagnosis of Chronic Temporomandibular Joint Disorder (CTMD) was established if the patient demonstrated pain/discomfort in the Temporomandibular Joint (TMJ) and muscles of mastication and masticatory dysfunction for a period, exceeding 6 months. After demographic questions, Hospital Anxiety and Depression Scale (HADS) was administered to each patient and the intensity and severity of Anxiety and Depression were recorded and documented by the Operator. **Results:** The percentage of Anxiety and Depression among patients with Chronic Temporomandibular Disorder (CTMD) was 31.46% (67/213) and 36.15% (77/213). **Conclusion:** In our respective study, the Frequency of psychological disorders like Anxiety and Depression were significantly high. Our results showed that an adequate and profound diagnosis and treatment planning is very necessary for all patients suffering from Chronic Temporomandibular Disorder (CTMD) so that both physical and psychological factors of patients with Chronic Temporomandibular Disorder (CTMD) should be taken into primary foremost consideration prior to the decision pertaining to its management respectively.

**Key words:** Anxiety, Chronic Temporomandibular Joint Disorder (CTMD), Depression, Hospital Anxiety and Depression Scale (HADS).

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the frequency of Anxiety and Depression have a remarkable impact in patients with Chronic Temporomandibular joint (CTMD). Moreover; this research study can be a valuable aid in increasing phenomenal success in contemporary future dentistry.

**INTRODUCTION**

The Temporomandibular Disorder (TMD), also termed as Temporomandibular Joint Disorder is considered as one of the most common disorder

that is primarily encountered in general population with a prevalence of up to 93%, reported in an epidemiological clinical study.<sup>1</sup> In this disease, patient complains of pain in Temporomandibular Joint and its associated anatomical muscles. Both somatic and psychogenic conditions like Anxiety and Depression are common with any Chronic facial pain including Temporomandibular Joint Disorder (TMD).<sup>2</sup> Psychological and emotional factors have been predominantly closely related to Temporomandibular Joint Disorder (TMD) and should be considered as an integral part of clinical presentation.<sup>3</sup> It has been reported that mental state<sup>4</sup>, like Anxiety, Depression and negative effects are far more common in patients with Temporomandibular Joint Disorder (TMD) as compare to healthy individuals.<sup>5</sup> It has been reported, that somatic factors like Stress, Depression and Anxiety the main etiological factors in the initiation, predisposition and perpetuation of Temporomandibular Joint Disorder (TMD).<sup>6</sup>

A research study conducted on adolescent patients having signs and symptoms of Temporomandibular Joint Disorder (TMD), showed a prevalence of Anxiety and Depression; 16.58% and 26.71% respectively.<sup>7</sup> An epidemiological clinical; research study has reported a frequency of 39.8% of patients exhibiting Temporomandibular Joint Disorder (TMD) and experiencing moderate to severe depression in the psychological status assessment.<sup>8</sup>

Many epidemiological research studies<sup>9,10</sup> have suggested that patients with significant signs and symptoms of Chronic Temporomandibular Joint Disorder (CTMD) have reported a higher prevalence of Anxiety and Depression and are thereby more common than in patients with a controlled group;<sup>11</sup> therefore a higher frequency of symptoms of Anxiety and Depression are common in patients with Temporomandibular Joint Disorder (TMD).<sup>12</sup>

Many clinical studies<sup>13,14</sup>, have reinforced a close association of Muscular tension, Anxiety, Depression and symptoms of Temporomandibular Joint Disorder (TMD).<sup>15</sup> One of the first to

permit multiple diagnoses, the novel popular classification scheme of Temporomandibular Joint Disorder (TMD) offers recommended guidelines for General Dental Practitioners, Specialists of all respective entities and those conducting clinical interventional studies.<sup>16</sup> This scheme was primarily applied to population with Temporomandibular Joint Disorder (TMD) and controlled patients.

Many self assessment scales have been developed for the evaluation of Anxiety and Depression in patients with Chronic Temporomandibular Joint Disorder (CTMD).<sup>17</sup> One of the most reliable diagnostic tool; for detecting the state of Anxiety and Depression in patients with Chronic Temporomandibular Joint Disorder (CTMD) is the "Hospital Anxiety and Depression Scale (HADS)".<sup>18</sup> This subscale, is primarily used to measure the intensity and severity of Hospital Anxiety and Depression that helps to determine the severity of emotional disorder. In terms of gender aspect, there are no significant gender differences in level of Anxiety and Depression on Hospital Anxiety and Depression Scale (HADS).<sup>19</sup> It has been demonstrated that by the introduction of a reliable scale like; Hospital Anxiety and Depression Scale, all the patients having Chronic Temporomandibular Joint Disorder (CTMD) are extremely benefitted in the detection and management. In this way, an emotional disorder like Anxiety and Depression can be properly investigated at the very first instance, diagnosed and managed in all medical and surgical department.<sup>20</sup>

The rationale of this research study is to find out the burden of co-morbid emotional factors; Anxiety and Depression among patients of Chronic Temporomandibular Joint Disorder (CTMD) and it is important to evaluate the somatic and emotional factors; Anxiety and Depression in patients with Temporomandibular Joint Disorder (TMD), as a complete and thorough understanding can improve the patient management and treatment planning; especially in chronic patients. We hypothesized, that Anxiety and Depression, the two emotional parameters have a significant remarkable association in patients with Chronic Temporomandibular Joint

Disorder (CTMD). The epidemiological data obtain from this study will create an awareness among the General dental practitioner, Oral and Maxillofacial Surgeons, Endodontists and all the other respective Dental Specialities that both physical and psychological factors of patients with Chronic Temporomandibular Joint Disorder (CTMD) should be taken into consideration prior to the decision of patient management.

## MATERIALS AND METHOD

This Cross-sectional Descriptive research study was conducted in the Department of Oral and Maxillofacial Surgery at Dr. Ishrat-ul-Ebad Khan Institute of Oral and Health Sciences(DIKIOHS), Dow University of Health Sciences and Dr. Ruth K.M. Pfau Civil Hospital, Karachi, Pakistan for a time period of 1 year from 1<sup>st</sup> March 2018 to 1<sup>st</sup> March 2019 2018 respectively. A total of (213) patients were selected; for this research study having Chronic Temporomandibular Joint Disorder (CTMD); taking Confidence Interval (C.I of 95% and Prevalence of 15.58% anxiety and 26.71% of Depression<sup>9</sup> and margin of error 5% concluding a sample size of (213) patients including in this research study<sup>14</sup> who attended the Oral and Maxillofacial Surgery Department of Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences (DIKIOHS), Dow University of Health Sciences and Dr. Ruth K.M. Pfau Civil Hospital, Karachi, Pakistan and fulfilling the particular inclusion criteria.

The diagnosis of Chronic Temporomandibular Joint Disorder (CTMD) was established after a detailed history taking procedure and a detailed through examination of Patients. The inclusion criteria for pertaining to this research study included patients of both genders (Males and Females) with 12-18 years of age; demonstrating pain and discomfort in the Temporomandibular Joint (TMJ), dysfunctioning and pain of Muscles of mastication for a time period, exceeding 6 months. The exclusion criteria for patients participating in this research study included; patients with a diagnosis of any major psychiatric disorder, All patients who had experienced death of any of their close relatives within the past 3 months, Patients taking any anti-depressants, anti-psychosis and

anxiolytics drugs, Patients who had received any type of orthodontic treatment, Patients having Temporomandibular Joint (TMJ) ankylosis, aplasia or hyperplasia contracture or hypertrophy and neoplasm, Patients with pain in bone and joint disease, Radiation treatment to head and neck, Patients with previous Temporomandibular Joint surgery, Neurological disorder, Rheumatological disorder and Pregnancy.

An approved consent was taken from the Ethical Review Board/Committee (ERC) of Dr. Ishrat-ul-Ebad Khan Institute of Oral and Health Sciences(DIKIOHS) and Dr. Ruth K.M. Pfau Civil Hospital, Karachi, Pakistan prior to the commencement of study. Before administration of questionnaire, the patients were briefly explained about the purpose and nature of the study. They were ensured that their information was used for the study purpose only and an Informed consent was taken from them.

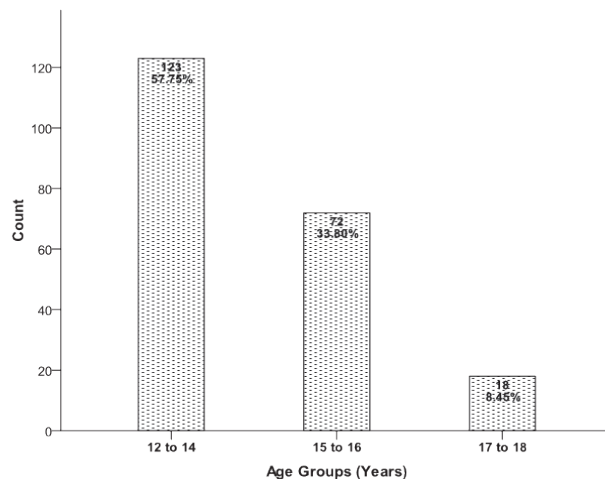
First of all, all demographic questions were used to gather information about the gender, age and marital status. After demographic questions, Hospital Anxiety and Depression Scale (HADS) was used on each patient to determine the intensity of Anxiety and Depression. A respective value of Depression score;  $\geq 14$  was considered as a profound state of "DEPRESSION" and  $< 14$  was considered as Normal. An Anxiety score;  $\geq 14$  was considered as a profound state of "ANXIETY" and  $< 14$  was considered as Normal.

All the relevant data and information were collected and well documented by the Operator, entered into the IBM SPSS (Statistical Package for the Social Sciences) version 25.0 and well analyzed accordingly. The Mean and Standard deviation were used as quantitative variables to evaluate the Age. Frequency and percentages was used for qualitative variables like Gender, Anxiety and Depression. A Chi-Square test was used with regards to Age, Gender on Anxiety and Depression levels for patients with Temporomandibular Joint Disorder (TMD). A P value of  $< 0.05$  was considered significant.

**RESULTS**

There were (213) patients, having a diagnosis of persisting Chronic Temporomandibular Joint Disorder (CTMD) for a time period of more than 6 months included in this research study. Out of (213) patients, 129(56.34%) were Male and 93(43.66%) were Female patients. The gender distribution of patients is shown in Figure-1. Majority of patients were 12-18 years of age as shown in (Graph-1). The average age of the patients was  $13.95 \pm 1.73$  years. The Anxiety and Depression score is shown in (Table-I). The Frequency of Anxiety and Depression among patients with Chronic Temporomandibular Joint Disorder (CTMD) was 31.46% (67/213) and 36.15% (77/213) as shown in (Figure-2 and Figure-3) respectively. The rate of Anxiety and Depression was above sixty percent (60%) and a significant difference was not observed among the different age as shown in (Table-II and III). Similarly the rate of Anxiety and Depression was not significant between Male and Female patients. The Stratification was also done in order to determine the Education status of patients and the Family income but the rate of Anxiety and Depression was also not significant among patients in Chronic Temporomandibular Joint Disorder (CTMD) with respect to Education and Family income as per the results of our research study.

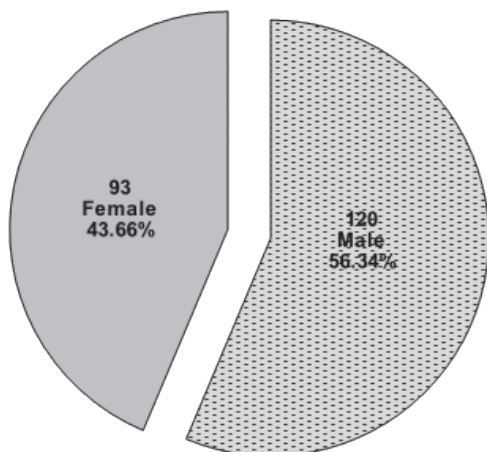
and somatic complaints;<sup>9,10,11</sup> including Mood changes, Fatigue, Extremes of tiredness and disturbances in Sleep thereby; leading to two of the most leading major problems;<sup>12,14,15</sup> Anxiety, and Depression.<sup>22</sup>



**Graph-1. Age distribution of patients.**

Statistics		Age (Years)	Anxiety Score	Depression Score
Mean		13.95	9.32	8.99
95% Confidence Interval for Mean	Lower Bound	13.71	8.59	8.20
	Upper Bound	14.18	10.05	9.78
Median		14	6	6
Standard Deviation		1.73	5.39	5.87
Interquartile Range		3	10	11

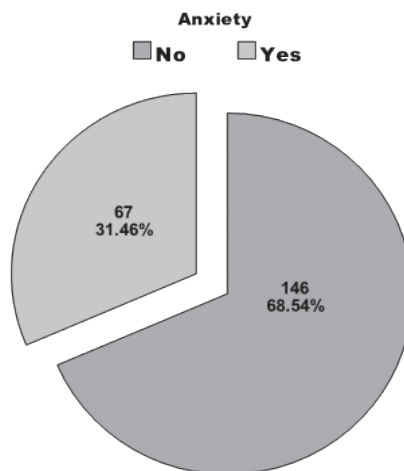
**Table-I. Descriptive statistics of patients showing anxiety and depression score.**



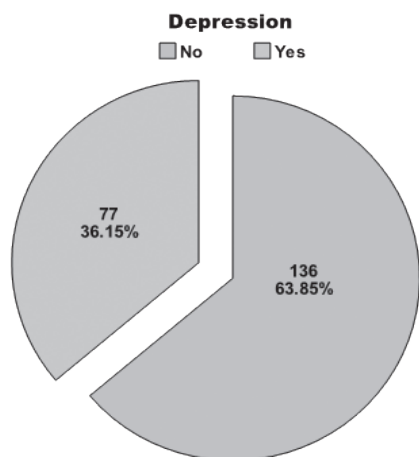
**Figure-1. Gender distribution of Patients.**

**DISCUSSION**

The Temporomandibular Joint Disorder (TMD), presenting itself as a therapeutic dilemma<sup>21</sup> is mostly related with psychological<sup>5,6</sup> emotional<sup>7,8</sup>



**Figure-2. Frequency of anxiety among patients with chronic temporomandibular disorder (CTMD).**



**Figure-3. Frequency of depression among patients with chronic temporomandibular disorder (CTMD).**

These emotional factors considerably vary depending on the etiologic sub group of diagnosis. Patients reporting Chronic Temporomandibular Joint Disorder (CTMD) possess these etiological factors and are mostly observed with myogenous subgroup.<sup>18</sup> Bertoli<sup>3</sup> (2016) has reported a higher level of the emotional parameters; Anxiety, Depression and Suicidal ideation in patients with Chronic Temporomandibular Joint Disorder (CTMD); primarily in patients exhibiting a long lasting muscle pain, as compared to the general population. Bertoli (2016) strongly emphasized the need for screening for suicidal tendencies and other significant comorbidities in patients suffering from Chronic Temporomandibular Joint Disorder (CTMD).

Age Groups (Years)	Anxiety		Total
	No	Yes	
12 to 14 Years	79(64.2%)	44(35.8%)	123
15 to 16 Years	54(75%)	18(25%)	72
17 to 18 Years	13(72.2%)	5(27.8%)	18
Chi-Square=2.56; p=0.27			

**Table-II. Frequency of anxiety among patients with chronic temporomandibular disorder (CTMD) with respect to age groups.**

Age Groups (Years)	Depression		Total
	No	Yes	
12 to 14 Years	75(61%)	48(39%)	123
15 to 16 Years	49(68.1%)	23(31.9%)	72
17 to 18 Years	12(66.7%)	6(33.3%)	18

Chi-Square=1.05; p=0.59

**Table-III. Frequency of depression among patients with chronic temporomandibular disorder (CTMD) with respect to age groups.**

Laskin<sup>17</sup>; for the very first time reported, that the main cause for Temporomandibular Joint Disorder (TMD) is Psychological rather than Physical. Over the past decade, many epidemiological studies<sup>19,20,23</sup> have been devoted in order to properly understand the relationship between psychological factors and Temporomandibular Joint Disorder (TMD).<sup>12,16,22,23</sup> It has been demonstrated that most of the patients suffering from Temporomandibular Joint Disorder (TMD)<sup>24,25</sup> have showed that their respective symptoms are highly increased during stressful situations.<sup>26,27</sup>

In our research study, we have used an excellent and a reliable diagnostic scale; commonly refer to as; Hospital Anxiety and Depression Scale (HADS).<sup>12,28,29</sup> This popular diagnostic scale<sup>17</sup> is used to evaluate the levels and severity of Anxiety and Depression of patients included in our study. The Hospital Anxiety and Depression Scale (HADS) is a total fourteen item scale<sup>23,30,31,32</sup> that primarily generates ordinal data. Among them seven of the items are linked to Anxiety and seven items are linked to Depression. Giannakopoulos, et al<sup>6</sup> (2010) also used the same scale to evaluate the frequency of Anxiety and Depression in patients with type I (muscle disorders) Temporomandibular Joint Disorder (TMD), type III Temporomandibular Joint Disorder and healthy controlled patients for a routine diagnostic and monitoring phase in future; Moreover as well as the prevalence of Chronic Facial Pain.

Bonjardim, et al<sup>9</sup> (2005) in his research; also used the same Hospital Anxiety and Depression Scale (HADS) in order to evaluate the prevalence of Anxiety and Depression in patients with

## Temporomandibular Joint Disorder (TMD).

In Sweden; an epidemiologic research study reported that 7% of 12 to 18 years old patients visiting the Public dental hospitals, met the research diagnostic criteria for Temporomandibular Joint Disorder (TMD).<sup>20</sup> The substantial frequency in these young children suggested that a proper diagnosis and treatment of Paediatric Temporomandibular Joint Disorder is considered as an important treatment dilemma, thereby providing a comfort to its sufferers and efforts, to take the advance action for this long-lasting pain and disability.

A research study in adolescent patients with significant features of signs and symptoms of Temporomandibular Joint Disorder (TMD) reported that the frequency of Anxiety and Depression was reported in 16.58% and 26.71%, of patients respectively.<sup>8</sup> In a sample of adolescent, the psychological and emotional status evaluation showed that 39.8% of patients with Temporomandibular Joint Disorder (TMD); reported moderate to severe levels of marked Depression, and 47.6% had moderate to severe nonspecific physical symptom scores (somatization).<sup>10</sup>

Dohrenwend et al;<sup>21</sup> have considered the pain as a causal stressor hypothesis, that has emphasized the fact that the stress and trauma of leading a life with symptoms of chronic pain leading to and moreover is highly associated with intense psychological and emotional distress.

In contrast to these studies; Dworkin et al;<sup>33</sup> reported that patients with a single pain condition, such as Temporomandibular Joint Disorder (TMD), thereby did not reveal a greater prevalence of signs and symptoms of Depression than persons with no present pain condition, but those with a number of pain conditions were at greater risk of Depression. Bonjardim et al;<sup>9</sup> (2005) evaluated that patients with Temporomandibular Joint Disorder (TMD) had no affirmation of either Anxiety or Depression symptoms although the Temporomandibular Joint Disorder (TMD) level was shown to be highly associated with Anxiety

but not to Depression.

Lajnert V<sup>26</sup> (2010), has recommended the introduction of a behavioral and psychological therapy for the patients with Chronic Temporomandibular Joint Disorder (CTMD). Apart from the conventional psychotropic drugs (tricyclic antidepressants), the advent of behavioral, motivational and psychological intervention and other management strategies such as stress management and modification of habits can be an excellent treatment strategy in the complete reduction of Depression, Anxiety and Tension in patients with Chronic Temporomandibular Joint Disorder (CTMD).<sup>34</sup>

Our research study has reported a significantly higher incidence of level of Anxiety and Depression in Male patients. This greater incidence in men as compare to women has been allocated to an interaction of a variety of multidisciplinary factors ranging from hormonal and biological factors to social and psychological parameters.<sup>27,29,30</sup> In contrast to our current research findings, many clinical and interventional epidemiological studies have concluded that a greater number of Female patients, suffer from Temporomandibular Joint Disorder (TMD) as compare to Male patients.<sup>21,23,25,28</sup> These result concludes the fact that approximately two to three times level of stress is much more common in women as compare to men.<sup>23,24,26,31,32</sup> In a community study conducted by Dworkin et al;<sup>24</sup>, 84% of patients, determining the treatment and 75% of patients not determining the treatment were primarily the women; thereby showing that Temporomandibular Joint Disorder (TMD) is considered to be as a habitual therapeutic disorder among women in their childbearing years respectively.<sup>35</sup>

## LIMITATIONS OF OUR RESEARCH STUDY

The limitations of our research study were that there was an unequal distribution of gender (Male and Female) patients that were selected primarily by a non-probability convenience sampling technique. A larger sample size should be used in more future epidemiological and clinical interventional research studies in a generalized larger population in order to determine the

significant impact of Anxiety and Depression in patients with Chronic Temporomandibular Joint Disorder (CTMD). Furthermore, more additional incorporation of quantitative and qualitative variables should be considered as a primary focus of attention and consideration. These can surely prove to be a highly valuable aid in modifying the contemporary and novel zones of modern and future dentistry.

## CONCLUSION

The following conclusions are made from the present respective study conducted, keeping the limitations of our research study in mind:

There is a strong association and impact of the two most important; psychological and somatic emotional factors, Anxiety and Depression in patients with Chronic Temporomandibular Joint Disorder (CTMD).

In terms of Age, generally patients with 18-20 years of age are having Chronic Temporomandibular Joint Disorder (CTMD) due to Anxiety and Depression.

Male patients with a lower Financial income are more likely to have Chronic Temporomandibular Joint Disorder (CTMD) due to Anxiety and Depression.

Keeping in mind all the above mentioned conclusions, there is a strong requirement of reforming the understanding and adequate knowledge of the imperative emotional factors; Anxiety and Depression; Understanding the fundamental anatomy of Temporomandibular Joint, Muscles of mastication, the relevant minor anatomical muscles and the impactful burden of Chronic Temporomandibular Joint Disorder (TMD) by the General Dental Practitioner, Oral and Maxillofacial surgeon Endodontist and Specialists of all respective entities with a meticulous organized systemic approach, in establishing a correct diagnosis to execute the best treatment plan and adequate management for the patient.

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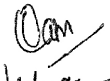
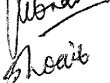

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Sr. #	Author-s Full Name	Contribution to the paper	Author's Signature
1	Arfa Baig	Original research article conception, Designing manuscript article, Research Drafting, Accountable for all aspects of the work.	
2	Bushra Ghani	Research Manuscript Article Designing and Writing, Drafting, Data Collection with Interpretation and Analysis, Literature Review, Critical Review, Expert Research Opinion, Finalization of Research Manuscript Article, Final Proof Reading and Final Approval of Research. Accountable for all aspects of the Work.	
3	Oam Parkash	Statistical data analysis and interpretation of data.	
4	Lubna Memon	Data collection.	
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