

Psychological Effect Of Chemosensory Deficits In COVID-19 Patients

Dr. Panchal Fairy*, Dr. Kagathara Jaydeep**, Dr. Patel Vilaschandra***

*Tutor, **Associate Professor, ***Professor And Head, Department Of Physiology, GCS, Medical College, Ahmedabad - 380025

Abstract: Background: Mental health was broke greatly in this COVID-19 pandemic. Objective: This study aimed to detect the effect of chemosensory deficits from deadly pandemic COVID-19 on mental health. Material And Methods: A survey questionnaire was used to detect the level of psychological problems in this cross-sectional observational study in sample size of 200 COVID-19 positive patients. Result: The findings shows that there is increase in prevalence of psychological problems which affects mental health drastically like isolation, anxious, afraid of failure to recover back which hampering their quality of life. Conclusion: This study emphasizes on the importance and prevention of psychological problems as well as role of counselling & treatment. [Panchal F Natl J Integr Res Med, 2022; 13(1): 37-41, Published on 26/01/2022]

Key Words: Chemosensory, COVID-19, Mental health, Psychological, Quality of Life (QOL)

Author for correspondence: Dr. Kagathara Jaydeep, Department Of Physiology, 4th Floor, GCS Medical College, Ahmedabad – 380025 E-Mail: j.kagathara@gmail.com Mobile: 9427170945

Introduction: A novel Corona virus disease (COVID-19) is an ongoing contagious disease, transmitting from human to human. In March 2020, World Health Organization (WHO) declared COVID-19 as pandemic¹. Corona virus is known to be neurotropic & neuroinvasive in nature, disrupting the biochemical and electro physiological homeostasis which could be responsible for chemosensory disorders in COVID-19 infected persons². The corona virus pandemic is rapidly spreading across the globe so much resulting in a surge of fear, anxiety, worry & stress especially in certain extreme age group of population who already having underlying co-morbidities like hypertension, diabetes mellitus, asthma, etc. And recently loss of smell and taste is also found as one of the prevalent symptoms associated with COVID-19 infections³.

Smell and taste are generally classified as visceral sense; and it is closely associated with gastrointestinal functions⁴. It is an important stimulant for digestion and utilization of nutrients as well. All environmental chemicals enter the body through nose and mouth and these visceral senses allow us to separate undesirable or lethal foods from those which are pleasurable to eat and nutritious, determines the flavour and palatability of food & beverages and also warn the dangerous environmental conditions including fire, natural gas leakage, spoiled food, etc⁵. So both senses are strongly associated with primitive emotional and behavioural functions of our nervous system⁶⁻⁸. These senses contribute considerably to the Quality of Life (QOL) and

when dysfunctional, can have unfavourable physical & psychological consequences^{3,9}. This COVID-19 pandemic, the psychological impact in people disturbed their mental health which affecting their daily routine activities¹⁰. The feeling of loneliness, depression, obsessive and compulsive behaviour, drug abuse, self-harm or suicidal behaviour also expected to increase in certain susceptible group of population^{3,9}.

Material & Methods: This study aimed to detect the effect of chemosensory deficits from deadly pandemic COVID-19 on mental health. A cross-sectional observational study based on questionnaire in a sample size of 200 laboratory confirmed COVID-19 patients was done digitally with prior consent. Information was collected digitally through Google form. Ethical approval was taken before starting the study from Institutional Ethical Committee.

The Inclusion Criteria: All laboratory confirmed COVID-19 patients either by Rapid Antigen Test or RT-PCR test. Patient > 18 years of age. Patient able to understand and answer the questionnaire digitally.

The Exclusion Criteria: Patient with chemosensory deficits prior to the onset of pandemic. Patient not willing to participate in the study.

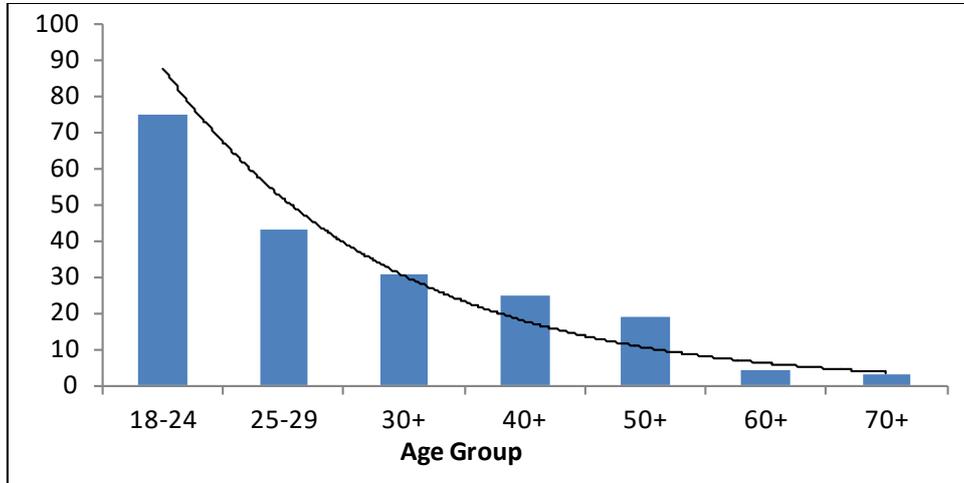
Questionnaire consisted of 2 sections. The former section covered the demographic data whereas the later section covered the questions related to

This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

quality of life (QOL) which could evaluate the mental condition or well-being of patient. Data were analyzed by the Statistical Package of Social Science (SPSS), software version 26.0 (SPSS Inc., 2019). The normality of data distribution was checked using the Kolmogorov–Smirnov test. The level of significance was set at 0.05.

Results: There were 200 laboratory confirmed COVID-19 positive patients analysed for study where 57% (N=113) were males and 43% (N=87) were females. The age distributions of 200 patients were graphed in Figure 1.

Figure 1: Age Distribution



The 52% (N=105) study population had loss of smell & taste both during COVID infection. The only loss of smell found in 67% (N=134) study population. The only loss of taste found in 63%

(N=125) study population. The 18% total COVID patients had fear; 'I will never ever recover my impairment!' while 31% COVID positive patient with chemosensory loss had fear for same.

Table: 1 Reported Value In Percentage Of Response To Questionnaire

Question	Response (%)
Do You Have Loss Of Smell & Taste?	
Yes	52
No	48
Do You Feel Because Of Problem With Taste & Smell You Are Eating Less?	
Yes	55
No	45
Do You Feel Because Of Problem With Taste & Smell You Are Losing Weight?	
Yes	38
No	62
Does The Change In Your Taste & Smell Make You Irritable Or Angry?	
Yes	36
No	64
Do You Feel Change In Your Taste & Smell Makes You Isolate Socially?	
Yes	30
No	70

Discussion: Chemosensory loss imposes a significant effect on patient’s day to day life. It will be difficult to have life without taste and smell¹¹. Smell is least understood in our senses.

Because of the close relationship between taste & smell, anosmia is associated with decreased taste sensibility and it contributes significantly to the Quality of life (QOL)^{3,12}. According to CDC

(Centre for Disease Control and Prevention), Health-related Quality of Life (HRQOL) is an individual’s or group’s perceived physical & mental health over time¹³. In other words QOL is the level of well-being felt by a group of people or individual on the functional impact of sickness & its treatment upon a patient as recognized by patient himself³. So, if the chemosensory loss persists for longer duration, QOL is affected.

Adverse effects in patients with olfactory loss have been reported including decreased pleasure, trouble in cooking & detecting spoiled food, alteration in body weight, reduced personal hygiene regarding safety issues, feeling of vulnerability, mood changes, depression & worsening social interactions, work life and sexual life^{3,14}.

The results of this study indicates that overall QOL is deteriorated after the smell loss in 67% patients which is higher than 39% mentioned by Temmel in post viral infection cases¹⁵; lower than 76% mentioned by Elkholi et al³ According to Temmel, younger patients had more complaints regarding alterations in QOL than the older patients¹⁵. In our study too, younger patients seem more affected.

In this study, 55 % of patients had avulsion of food/ decreased in appetite and “less interest in food & drink” also been reported by Nordin et al¹⁶, Ferris et al¹⁷ and mattes et al¹⁸ in 15%, 69% and 50% of their patients respectively.

Complaints of loss in taste sense in COVID-19 patients are likely due to smell deficit rather than taste bud’s dysfunction or lesion in taste pathway. Therefore, majority of patients who has complained taste loss had also loss of smell.

Loss of appetite itself a big concern for an individual, which can lead to serious side effects like malnutrition, weakness, decreased immunity and makes patient more susceptible to infections.

In this study, 38% patients had lost their original weight because of decreased appetite.

Taste impairment has proven to contribute to under nutrition, who often has lost body weight already at the time of diagnosis, further deteriorating their nutritional status and quality of life.

According to JR Lechien et al¹⁹, the impact of olfactory dysfunction on patient’s QOL; in anosmic patients at the time of evaluation had a significant lower sQOD-NS (short version of questionnaire of olfactory disorders-negative statement) score as compared with hyposmic and normosmic individuals (p=0.001) whereas in this study, 30% people felt isolated (p=0.000), 36% were irritated and anxious (p=0.000) & 31% were

afraid/scared if they do not recover their chemosensory deficits permanently (p=0.000).

Arnout et al findings indicated that the increased prevalence of COVID-19 has a negative effect on mental health of individuals as the level of psychological problems were increased and results also found differences in the prevalence of psychological problems symptoms due to demographic variables²⁰.

The present study has some limitations as its cross-sectional in nature; we can predict the prevalence and direction of effects behind increased psychological problems.

The current study did not utilized DSM based criteria for assessing mental health symptoms.

Therefore, a standardized protocol/ survey instrument for psychological testing which covers full spectrum of psychological symptoms should be developed.

We also cannot estimate the intensity of severity of symptoms of psychological effects i.e., objective testing not done because of current social distancing regulations. In this study all collected data were self-reported.

So, apparent predominance of male genders which call for further investigations to check whether it reflects gender differences simply while distribution or actual association in the survey.

Conclusion: From the current study the effect of COVID-19 pandemic on patient’s mental health was much more beyond the primary recovery period. So special attention must be given to the patients during treatment and then after during post-recovery follow-up is required to assess long term effect on mental health.

Priority should be given to identify ill-effects in COVID-19 patients with chemosensory loss who have significant loss in Health-related QOL and role of counselling & psychotherapy should be focused to remove the stigma, to cope the stress and can have better Quality of life.

Acknowledgment: We are thankful to Dr. Arpit & Dr. Sudip from Community Medicine department for helping out to streamline this study.

References:

1. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020 [Internet]. [cited 2022 Jan 4]. Available from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
2. Li YC, Bai WZ, Hashikawa T. The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. *J Med Virol* [Internet]. 2020 Jun 1 [cited 2022 Jan 4];92(6):552–5. Available from: <https://pubmed.ncbi.nlm.nih.gov/32104915/>
3. Elkholi SMA, Abdelwahab MK, Abdelhafeez M. Impact of the smell loss on the quality of life and adopted coping strategies in COVID-19 patients. *Eur Arch Oto-Rhino-Laryngology* [Internet]. 2021 Sep 1 [cited 2022 Jan 4];278(9):1. Available from: </pmc/articles/PMC7814376/>
4. Smell & Taste | Ganong's Review of Medical Physiology, 25e | AccessMedicine | McGraw Hill Medical [Internet]. [cited 2022 Jan 4]. Available from: <https://accessmedicine.mhmedical.com/content.aspx?bookid=1587§ionid=97163266>
5. Smell (Olfactory) Disorders—Anosmia, Phantosmia & Others | NIDCD [Internet]. [cited 2022 Jan 4]. Available from: <https://www.nidcd.nih.gov/health/smell-disorders>
6. Krusemark EA, Novak LR, Gitelman DR, Li W. When the Sense of Smell Meets Emotion: Anxiety-State-Dependent Olfactory Processing and Neural Circuitry Adaptation. *J Neurosci* [Internet]. 2013 [cited 2022 Jan 4];33(39):15324. Available from: </pmc/articles/PMC3782615/>
7. Katz DB, Sadacca BF. Taste. *Neurobiol Sensat Reward* [Internet]. 2011 [cited 2022 Jan 4]; Available from: <https://www.ncbi.nlm.nih.gov/books/NBK92789/>
8. Chen D, Dalton P. The effect of emotion and personality on olfactory perception. *Chem Senses*. 2005 May;30(4):345–51.
9. Hummel T, Nordin S. Olfactory disorders and their consequences for quality of life. *Acta Otolaryngol*. 2005;125(2):116–21.
10. Hopkins C, Surda P, Nirmal Kumar B. Presentation of new onset anosmia during the covid-19 pandemic. *Rhinology*. 2020; 58(3):295–8.
11. Menni C, Valdes AM, Freidin MB, Ganesh S, El-Sayed Moustafa JS, Visconti A, et al. Loss of smell and taste in combination with other symptoms is a strong predictor of COVID-19 infection. *Nat Med*. 2020;
12. Jeon S, Kim Y, Min S, Song M, Son S, Lee S. Taste sensitivity of elderly people is associated with quality of life and inadequate dietary intake. *Nutrients* [Internet]. 2021 May 1 [cited 2022 Jan 4];13(5). Available from: </pmc/articles/PMC8155931/>
13. Health-Related Quality of Life (HRQOL) | CDC [Internet]. [cited 2022 Jan 4]. Available from: <https://www.cdc.gov/hrqol/index.htm>
14. Pusswald G, Auff E, Lehrner J. Development of a brief self-report inventory to measure olfactory dysfunction and quality of life in patients with problems with the sense of smell. *Chemosens Percept*. 2012 Dec;5(3–4):292–9.
15. P Temmel AF, Quint C, Schickinger-Fischer B, Klimek L, Stoller E, Hummel T. Characteristics of Olfactory Disorders in Relation to Major Causes of Olfactory Loss [Internet]. Vol. 128, *Arch Otolaryngol Head Neck Surg*. 2002. Available from: <https://jamanetwork.com/>
16. Nordin S, Monsch AU, Murphy C. Unawareness of Smell Loss in Normal Aging and Alzheimer's Disease: Discrepancy between Self-Reported and Diagnosed Smell Sensitivity. *Journals Gerontol Ser B* [Internet]. 1995 Jul 1 [cited 2022 Jan 4];50B(4):P187–92. Available from: <https://academic.oup.com/psychogerontology/article/50B/4/P187/577960>
17. FERRIS AM, DUFFY VB. Effect of olfactory deficits on nutritional status. Does age predict persons at risk? *Ann N Y Acad Sci* [Internet]. 1989 [cited 2022 Jan 5];561(1):113–23. Available from: <https://pubmed.ncbi.nlm.nih.gov/2735670/>
18. Mattes RD, Cowart BJ, Shiavo MA, Arnold C, Garrison B, Kare MR, et al. Dietary evaluation of patients with smell and/or taste disorders. *Am J Clin Nutr*. 1990;51(2):233–40.
19. Lechien JR, Chiesa-Estomba CM, De Siati DR, Horoi M, Le Bon SD, Rodriguez A, et al. Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study. *Eur Arch Oto-Rhino-Laryngology*. 2020 Aug 1;277(8):2251–61.
20. Arnout BA, Al-Dabbagh ZS, Eid NA Al, Eid MA Al, Al-Musaibeh SS, Al-Miqtiq MN, et al. The Effects of Corona Virus (COVID-19) Outbreak on the Individuals' Mental Health and on the

Decision Makers: A Comparative Epidemiological Study. Int J Med Res Heal Sci [Internet]. 2020 Mar 23 [cited 2022 Jan 5];9(3):26–47. Available from: <https://www.ijmrhs.com/abstract/the-effects-of-corona-virus-covid19-outbreak-on-the-individuals-mental-health-and-on-the-decision-makers-a-comparative-e-44682.html>

Conflict of interest: None
Funding: None
Cite this Article as: Panchal F, Kagathara J, Patel V. Psychological Effect Of Chemosensory Deficits In COVID-19 Patients. Natl J Integr Res Med 2022; Vol.13(1): 37-41