Journal of Health and Rehabilitation Research 2791-156X JHRR

For contributions to JHRR, contact at email: editor@jhrlmc.com

Original Article

Evaluation of Oral Health Habits and Gingival Conditions after Covid-19 Lockdown

Shaista Parveen[1], Sandeep Kumar[1*], Abdul Bari Memon[1], Permanand[2], Shazia Shakeel[1], Sunny1, Pinki[1], Lovekesh Kumar[3]

[1]Bibi Aseefa Dental College, Larkana

[2]Bhittai Dental & Medical College, Mirpurkhas

[3]Dow University of Health Sciences, Karachi

[*]Corresponding Author: Sandeep Kumar, BDS; Email: sandeepbds1987@gmail.com

Conflict of Interest: None.

*Parveen S., et al. (2023). 3(2): **DOI**: https://doi.org/10.61919/jhrr.v3i2.166*

ABSTRACT

Background: The COVID-19 pandemic has had a profound impact on various aspects of health and healthcare practices, including oral health. With changes in daily routines and access to dental care services during lockdowns, there has been concern about the potential decline in oral hygiene and an increase in dental issues.

Objective: This study aimed to evaluate oral health habits and the gingival condition of patients visiting a tertiary care dental hospital in the southern region of Sindh province after the COVID-19 lockdown.

Methods: A cross-sectional study was conducted at Bibi Aseefa Dental College, Larkana, from January 20, 2021, to July 20, 2021. Ethical approval was obtained, and participants gave written informed consent. A total of 278 patients were sampled using a convenience sampling method. The inclusion criteria were patients of both genders, above the age of 7, with permanent teeth. Exclusion criteria included lack of consent and cases with jaw fractures or limited mouth opening. Data collection involved clinical examinations using a dental mirror and probe, and oral health practices were recorded. Statistical analysis was performed using SPSS version 21.

Results: The study comprised 57.2% male and 42.8% female participants, with a mean age of 30.67 ± 10.31 years. An 81% adherence to daily tooth brushing was noted, while only 9% of participants used dental floss. The use of medicated toothpaste was reported by 18% of the participants. The prevalence of gingivitis was found to be 48%, with a significant relationship between gender and gingivitis severity (p=0.009).

Conclusion: Oral hygiene practices during the lockdown were found to be inadequate, with a substantial prevalence of gingivitis among the study population. The study emphasizes the need for improved oral hygiene practices, including regular brushing and flossing, and suggests public health initiatives to promote oral health awareness.

Keywords: COVID-19, Oral Health, Gingivitis, Oral Hygiene Practices, Dental Care, Pandemic.

INTRODUCTION

In March 2020, the World Health Organization (WHO) officially declared COVID-19 a pandemic. This highly infectious disease is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and is primarily transmitted through aerosols, infected droplets, or direct contact with mucous membranes (1-5).

The pandemic prompted several nations to declare states of emergency, leading to widespread implementation of social isolation and national quarantine measures to control the spread of the virus (6). These measures significantly impacted dental care, as the generation of aerosols during procedures such as scaling and drilling, as well as the close proximity in dental settings, increased the risk of viral transmission (7). Consequently, health authorities advised the public to defer nonessential dental treatments and recommended that dentists focus on emergency cases only (8,9).

Oral health is a crucial component of overall health, as it is interconnected with various bodily systems, including the gastrointestinal tract, throat, and cardiovascular and endocrinological systems (10,11). Good oral hygiene is about more than just healthy teeth; it encompasses a broader spectrum of health maintenance (12). For the upkeep of oral hygiene, it is recommended to limit the consumption of fermented carbohydrates, acidic foods, and certain beverages (13). Additionally, the use of fluoridated toothpaste

Journal of Health and Rehabilitation Research 2791-156X JHRR

for brushing, along with antibacterial mouthwashes and dental floss, is advocated for maintaining good oral health (14,15). However, smoking negatively impacts oral health and complicates the treatment of COVID-19 patients (16,17).

Post-lockdown, many countries have reported an increase in dental problems (18). The pandemic led to postponements or cancellations of routine dental appointments, which not only placed a greater burden on emergency services (19) but also impacted various medical disciplines and overall medical care (20). The fear of contracting COVID-19 also resulted in many patients avoiding dental treatments. Consequently, the importance of practicing good oral hygiene at home has become even more significant (21).

During the lockdown, dietary habits shifted as children and adults alike indulged in high-sugar, processed foods, often associated with inactivity and negative emotions (2,6,22,23). Such dietary choices, coupled with poor oral hygiene, are linked to an increased risk of gingival inflammation (24). Furthermore, studies suggest that gingival inflammation and bleeding can influence an individual's frequency of brushing (25). The lockdown also brought changes in daily routines, eating habits, and increased time spent on the internet and watching television, all of which have implications for oral health. However, data specific to our population on these changes is lacking. Therefore, the purpose of our study is to evaluate oral health habits and gingival conditions following the COVID-19 lockdown.

MATERIAL AND METHODS

The study was a cross-sectional analysis conducted at Bibi Aseefa Dental College, Larkana. Data collection occurred over a six-month period, from January 20, 2021, to July 20, 2021. Prior to commencement, ethical approval was obtained from the research committee of the university. Participation in the study was contingent upon written informed consent from all participants.

The sample size for the study was determined to be 278 individuals, calculated using the Raosoft online sample size calculator. This sample size was deemed appropriate for achieving statistically significant results within the scope of the research. The study employed a convenience sampling method to recruit participants, ensuring ease of data collection and efficiency.

Inclusion criteria were set to encompass patients of both genders, possessing permanent dentition, and aged 7 years and above. Exclusion criteria were defined to omit individuals who did not provide consent, as well as those presenting with fractures of one or both jaws, or with limited mouth opening, as these conditions could potentially skew the oral health data.

For the clinical examination, a standard dental mirror and a blunt, ball-ended probe with a diameter of 0.5mm were utilized. Each tooth was identified according to the FDI World Dental Federation notation, beginning with the posterior teeth. The assessment of gingivitis was conducted using the Loe and Silness Gingival Index, a recognized tool for evaluating the severity and prevalence of gingivitis.

Data collection involved recording a comprehensive set of information. This included demographic data (such as age and gender), oral hygiene practices (frequency of brushing and flossing, and toothpaste usage), and the presence and extent of gingivitis. All collected data were meticulously entered into a structured proforma for organization and analysis.

Statistical analysis was carried out using SPSS software, version 21. This involved the classification of variables into qualitative and quantitative categories. Qualitative variables, such as the prevalence of gingivitis and participant gender, were expressed in terms of percentages and frequencies. Quantitative variables, namely age, were presented using mean values and standard deviations. To explore the relationship between gender and the prevalence of gingivitis, a Chi-square test was applied, with a significance level set at 0.05.

RESULTS

Table-1 presents the distribution of participants by gender and their mean age. Of the 278 participants, a majority were male, accounting for 57.2% (159 individuals), while females represented 42.8% (119 individuals). This distribution highlights a slightly higher participation of males in the study. In terms of age, the participants had a mean age of 30.67 years, with a standard deviation of 10.31 years. This age range indicates a relatively young adult population and provides a basis for understanding the oral health habits and gingival conditions within this demographic segment.

Table-1 Descriptive statistics of gender and age

Characteristics	Frequency	Percent
Gender		
Male	159	57.2
Female	119	42.8
Total	278	100.0

Journal of Health and Rehabilitation Research 2791-156X JHRR

Characteristics	Frequency	Percent
Age		
Mean age	30.67 ± 10.31	

Table-2 details the oral hygiene habits of the participants. Regarding brushing frequency, a significant majority, 80.9% (225 individuals), reported brushing once daily, while only 9.0% (25 individuals) brushed twice and a mere 0.7% (2 individuals) brushed thrice daily. Interestingly, 1.4% (4 individuals) did not brush at all, and 7.9% (22 individuals) brushed occasionally. Flossing was notably less prevalent, with only 9% (25 individuals) of the participants engaging in this practice, while a vast majority of 91% (253 individuals) did not floss. As for toothpaste usage, 77.7% (216 individuals) used normal toothpaste, 18% (50 individuals) used medicated variants, and a small group of 3.6% (10 individuals) reported using other types of dental cleaning aids. Only 0.7% (2 individuals) did not use toothpaste at all.

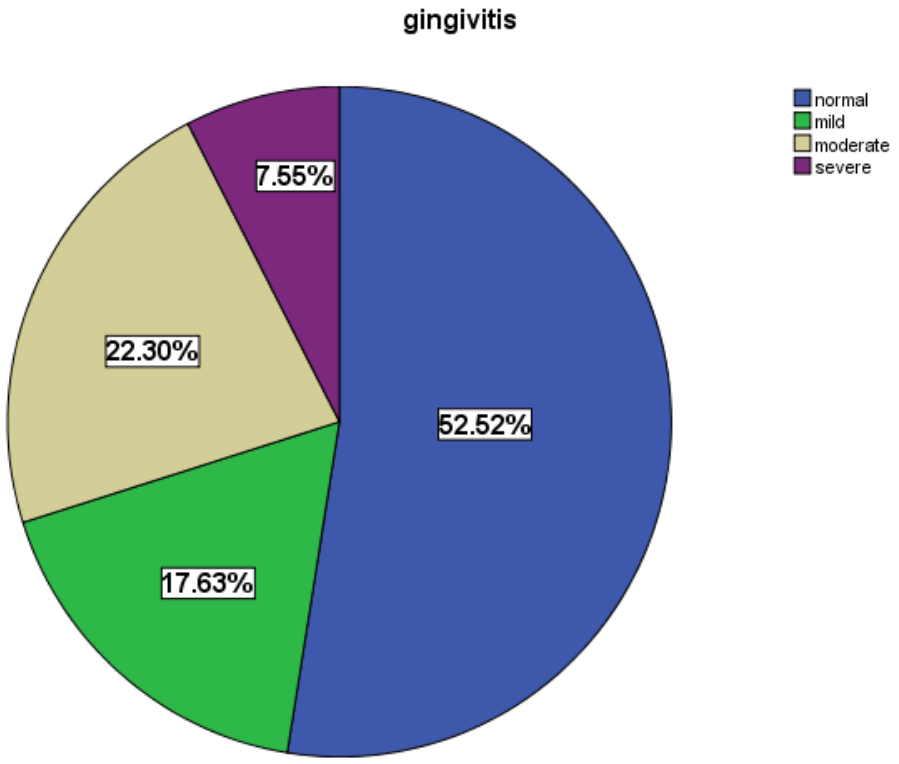

Figure 1 Prevalence of gingivitis

The pie chart illustrates the prevalence of gingivitis among the study population. It shows that a little over half of the participants, specifically 52.52%, exhibit normal gingival conditions, indicating no signs of gingivitis. Mild gingivitis is present in 17.63% of the participants, while moderate gingivitis is observed in 22.30%, suggesting that these two categories combined affect a significant portion of the study group. Severe gingivitis, the most advanced stage of the condition, is less common but still present in 7.55% of the participants. The chart clearly demonstrates that while a majority of the participants have healthy gums, a notable fraction has some level of gingival inflammation.

Table-2 Descriptive statistics of Oral Habits

Characteristics	Frequency	Percent
Brushing frequency		
None	4	1.4
Once	225	80.9
Twice	25	9.0
Thrice	2	0.7
Occasional	22	7.9
Flossing		
Yes	25	9
No	253	91
Usage of toothpaste		

Journal of Health and Rehabilitation Research 2791-156X JHRR

Characteristics	Frequency	Percent
No	2	0.7
Normal	216	77.7
Medicated	50	18
Others	10	3.6
Total	278	100.0`

Table-3 explores the relationship between gender and the prevalence of gingivitis among the participants. Out of 159 male participants, 57.9% (92 individuals) exhibited normal gingival conditions, while 18.2% (29 individuals) had mild gingivitis, 18.9% (30 individuals) moderate, and 5.0% (8 individuals) severe gingivitis. Among the female participants, 45.4% (54 individuals) had normal gingiva, 16.8% (20 individuals) mild gingivitis, 26.9% (32 individuals) moderate, and 10.9% (13 individuals) severe gingivitis. The total distribution showed 52.5% (146 individuals) with normal gingiva, 17.6% (49 individuals) with mild, 22.3% (62 individuals) with moderate, and 7.6% (21 individuals) with severe gingivitis.

Table-3 relationship of gender with gingivitis

Gender	Gingivitis				Total	P value
	Normal	Mild	Moderate	Severe		
Male	92	29	30	8	159	0.009
	57.9%	18.2%	18.9%	5.0%	100.0%	
Female	54	20	32	13	119	
	45.4%	16.8%	26.9%	10.9%	100.0%	
Total	146	49	62	21	278	
	52.5%	17.6%	22.3%	7.6%	100.0%	

The Chi-square test yielded a p-value of 0.009, indicating a statistically significant difference in the prevalence of gingivitis between males and females, with females showing a higher tendency towards moderate and severe gingivitis.

DISCUSSION

The research conducted was a pivotal examination of the effects of the COVID-19 pandemic on oral health among patients attending a tertiary care dental hospital in the southern region of Sindh province. The COVID-19 pandemic, a health crisis unprecedented in modern times (26), has had extensive repercussions on physical and mental well-being, significantly impinging upon general and oral health (27, 28). As the pandemic persisted, ensuring adherence to basic oral hygiene and maintaining appropriate oral health behaviors became increasingly arduous. It was observed that adherence to health-promoting behaviors such as regular brushing and exercising had a positive impact on health during the lockdown (29). Conversely, neglect of such routines correlated with detrimental effects on both general and oral health (30, 31).

This study represented the first effort within the local context to systematically assess dental hygiene practices and gingival health subsequent to the COVID-19 lockdown. The frequency of tooth cleaning and flossing is fundamental to oral health maintenance. Findings indicated that a substantial proportion of patients—81%—persisted in their usual tooth-brushing routine, a statistic that contrasts with the findings of Keles et al. (32), who reported no change in brushing habits among 71% of their subjects.

The research highlighted that the majority of participants did not incorporate flossing into their oral care regimen, corroborating the findings of Ana et al. (33). Additionally, it was noted that a minor segment of the population, 18%, resorted to medicated toothpaste to maintain oral hygiene, possibly due to impediments in accessing dental services during the lockdown. The prevalence of gingivitis stood at 48%, a figure that diverges from the findings of Zhang et al. (34), which may be attributed to differences in population, educational levels, and the absence of awareness programs in the region under study. The maintenance of oral hygiene is intrinsically linked to the reduction of oral diseases.

Brushing frequency emerged as a critical factor in the preservation of oral hygiene. Within the scope of this study, only 9% of participants brushed their teeth twice daily, a practice not aligned with the results presented by Zhang et al. (34), where a higher frequency of brushing was reported.

Journal of Health and Rehabilitation Research 2791-156X JHRR

CONCLUSION

The study concluded that oral hygiene practices were suboptimal during the lockdown period, with a significant manifestation of gingivitis among the majority of patients. It is imperative that individuals enhance their oral hygiene by brushing at least twice a day using fluoridated toothpaste. Furthermore, the organization of oral hygiene seminars is recommended to bolster public awareness and promote better oral health practices.

REFERENCES

1. WHO. Director-General's Opening Remarks at the Media Briefing on COVID-19. 2020. Available online: https://www.who.int/ dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19
2. Brondani, B.; Knorst, J.K.; Tomazoni, F.; Cósta, M.; Vargas, A.W.; Noronha, T.G.; Mendes, F.M.; Ardenghi, T.M. Effect of the COVID-19 pandemic on behavioral and psychosocial factors related to oral health in adolescents: A cohort study. Int. J. Paediatr. Dent. 2021, 31, 539–546.
3. Fux-Noy, A.; Mattar, L.; Shmueli, A.; Halperson, E.; Ram, D.; Moskovitz, M. Oral Health Care Delivery for Children during COVID-19 Pandemic—A Retrospective Study. Front. Public Health 2021, 9, 637351.
4. González-Olmo, M.J.; Delgado-Ramos, B.; Ruiz-Guillén, A.; Romero-Maroto, M.; Carrillo-Díaz, M. Oral hygiene habits and possible transmission of COVID-19 among cohabitants. BMC Oral Health 2020, 20, 286.
5. Goswami, M.; Grewal, M.; Garg, A. Attitude and practices of parents toward their children's oral health care during COVID-19 pandemic. J. Indian Soc. Pedod. Prev. Dent. 2021, 39, 22–28.
6. Campagnaro, R.; Collet, G.; Andrade, M.; Salles, J.; Fracasso, M.; Scheffel, D.; Freitas, K.; Santin, G. COVID-19 pandemic and pediatric dentistry: Fear, eating habits and parent's oral health perceptions. Child Youth Serv. Rev. 2020, 118, 105469. [CrossRef]
7. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. J Dent Res. 2020;99(5):481-487.
8. Centers for Disease Control and Prevention. COVID-19: Guidance for dental settings. Accessed December 4, 2020. https://www.cdc.gov/coronavirus/201 9-ncov/hcp/dental-settings.htm
9. Sama BK, Kaur P, Thind PS, Verma MK, Kaur M, Singh DD. Implications of COVID-19-induced nationwide lockdown on children's behavior in Punjab, India. Child Care Health Dev. 2021;47(1):128-135.
10. Dörfer C, Benz C, Aida J, Campard G. The relationship of oral health with general health and NCDs: a brief review. Int Dent J 2017; 67 (Suppl 2): 14-8.
11. Kanjirath PP, Kim SE, Rohr Inglehart M. Diabetes and oral health: the importance of oral health-related behavior. J Dent Hyg 2011; 85: 264-72.
12. Patrick DL, Lee RS, Nucci M, Grembowski D, Jolles CZ, Milgrom P. Reducing oral health disparities: a focus on social and cultural determinants. BMC Oral Health 2006; 6(Suppl 1): S4
13. Gondivkar SM, Gadbail AR, Gondivkar RS, Sarode SC, Sarode GS, Patil S, et al. Nutrition and oral health. Dis Mon 2019; 65: 147-54.
14. Choo A, Delac DM, Messer LB. Oral hygiene measures and promotion: review and considerations. Aust Dent J 2001; 46: 166-73.
15. Lang NP, Cumming BR, Löe H. Toothbrushing frequency as it relates to plaque development and gingival health. J Periodontol 1973; 44: 396-405.
16. Agnihotri R, Gaur S. Implications of tobacco smoking on the oral health of older adults. Geriatr Gerontol Int 2014; 14: 526-40.
17. Vardavas CI, Nikitara K. COVID-19 and smoking: A systematic review of the evidence. Tob Induc Dis 2020; 18: 20
18. Hopcraft, M.; Farmer, G. Impact of COVID-19 on the provision of paediatric dental care: Analysis of the Australian Child Dental Benefits Schedule. Community Dent. Oral Epidemiol. 2021, 49, 369–376.
19. 19.Guo H, Zhou Y, Liu X, Tan J. The impact of the covid-19 epidemic on the utilization of dental emergency services. J Dent Sci 2020;15:564-567.
20. Hartnet KP, Kite-powel A, Devies-J, Colleta MA, Bohemer TK, Adjemian J, et al. Impact of the COVID-19 pandemic on the emergency department visits- Uinted States, January 1, 2019-May 30, 2020. MMWR Morb Mortal Wkly Rep 2020;69:699-704.
21. Blumer, S.; Dagon, N.; Peretz, B.; Ratson, T.; Kharouba, J. Function of the Family Unit, Oral Hygiene Rules and Attitudes to Dental Health in Children During First-Wave 2020 COVID-19 Lockdown. J. Clin. Pediatr. Dent. 2021, 45, 1–7. [CrossRef]

Journal of Health and Rehabilitation Research 2791-156X JHRR

22. Philippe, K.; Chabanet, C.; Issanchou, S.; Monnery-Patris, S. Child eating behaviors, parental feeding practices and food shopping motivations during the COVID-19 lockdown in France: (How) did they change? Appetite 2021, 161, 105132. [CrossRef
23. Di Renzo, L.; Gualtieri, P.; Pivari, F.; Soldati, L.; Attinà, A.; Cinelli, G.; Leggeri, C.; Caparello, G.; Barrea, L.; Scerbo, F.; et al. Eating habits and lifestyle changes during COVID-19 lockdown: An Italian survey. J. Transl. Med. 2020, 18, 229. [CrossRef]
24. Ko¨nig KG, Navia JM. Nutritional role of sugars in oral health. The American journal of clinical nutrition. 1995; 62(1):275–82. 7.
25. Gherunpong S, Tsakos G, Sheiham A. The prevalence and severity of oral impacts on daily performances in Thai primary school children. Health and quality of life outcomes. 2004; 2(1):57.
26. United Nations. 2020. Shared responsibility, global solidarity: responding to the socio-economic impacts of COVID-19. Available from: https:// www.un.org/sites/un2.un.org/fles/sg_report_socio-economic_impact_ of_covid19.pdf. Accessed June 2020.
27. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. JAMA. 2020;323(11):1061–9.
28. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 Coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health. 2020;17(5):1729.
29. Ca˘ ra˘ mida˘ M, Dumitrache MA, T´ âncu AMC, Ilici RR, Ilinca R, Sfeatcu R. Oral Habits during the Lockdown from the SARS-CoV-2 Pandemic in the Romanian Population. Medicina. 2022;58(3):387.
30. Gotler M, Oren L, Spierer S, Yarom N, Ashkenazi M. The impact of COVID-19 lockdown on maintenance of children's dental health: A questionnaire-based survey. The J Am Dent Assoc. 2022;153(5):440-49.
31. Carrel AL, Clark RR, Peterson S, Eickhoff J, Allen DB. School-based fitness changes are lost during the summer vacation. Arch Pediatr Adolesc Med. 2007;161(6):561-64.
32. Keles ZH, Sancakli HS. Evaluation of knowledge, attitude and behaviour on oral health through COVID-19 pandemic.
33. Costa AL, Pereira JL, Franco L, Guinot F. COVID-19 lockdown: impact on oral health-related behaviors and practices of Portuguese and Spanish children. International Journal of Environmental Research and Public Health. 2022 Nov 30;19(23):16004.
34. Zhang S, Liu C, Zhang C, Jiang H, Tai B, Du M. Impact of COVID-19 on the oral health of adults in Wuhan and China: results of a nationwide online cross-sectional questionnaire survey. BMC Oral Health. 2021 Dec;21:1-7.