

# Comparative Analysis of Quality of Life and Oral Hygiene Attitudes of patients using Dental Prostheses during the COVID-19 Pandemic: An Original Study

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## ABSTRACT:

**Background:** Quality of life related to oral health is affected by several problems of oral cavity as result of natural tooth loss. The life quality of people can be improved by providing the dental prosthesis in patients suffering from missing teeth. The COVID -19 pandemic has started from China since the last phase of 2019. From then till now there is no aspect of human life which has been negatively influenced by this pandemic. Although there has been various research programmes which has been carried out to assess the influence of COVID 19 pandemic over different types of patients but there are very few studies which has been conducted to analyse the condition of patients having dental prosthesis in this pandemic.

**Aim:** To carry out comparative analysis of quality of life and oral hygiene attitudes of patients using dental prostheses during the COVID-19 pandemic

**Materials and Methods:** The study comprised 129 people who were randomly chosen from among those who had been seen in the same clinic before the COVID-19 epidemic. Complete dentures, implant-retained removable dentures, tooth-supported fixed partial dentures, and implant-supported fixed partial dentures were separated into four groups based on the type of prosthesis they wore. Telephone interviews with study participants were used to administer the Oral Health Impact Profile (OHIP-14) questionnaire, which included questions on their concerns and actions taken related prosthesis hygiene during the pandemic.

**Results:** The maintenance of hygiene of the prosthetic devices and frequency of cleaning of the dentures was more during this pandemic. The incidence of functional limitation was more during pandemic and it was greatest in patients using implant retained removable dentures. It was also observed that patients were benefitted from the knowledge they gained from authentic literature sources in concern with adequate cleaning of prosthodontic appliances.

**Conclusion:** It was concluded from the current study that the maintenance of hygiene of the prosthetic devices and frequency of cleaning of the dentures was more during this pandemic. The incidence of functional limitation was more during pandemic and it was greatest in patients using implant retained removable dentures

**Keywords:** COVID-19, Quality of life, Prosthetics.

## INTRODUCTION

Quality of life related to oral health is affected by the frequent problems of oral cavity like loss of esthetics, loss of speech, loss of mastication as result of natural tooth loss. The life quality of people can be improved by providing the dental prosthesis in patients suffering from missing teeth.<sup>1,2</sup> This is achieved by restoration of functions of oral cavity and overall esthetics of the individual. In order to meet the requirements of different types of edentulous patients there are various prosthodontic treatment options. These treatment options are meant for difference in the patients expectations and number of lost teeth. These treatment options are tooth supported fixed partial dentures, implant supported fixed partial dentures, tooth supported RPDs, implant supported RPDs, complete dentures and implant supports complete dentures.<sup>3,4</sup>

A new index has been introduced to inquire about the prognosis of prosthodontic treatment modalities. This index is termed as OHIP-14 index ( Oral Health Impact Profile-14). This index is the most accepted index for

analysing the quality of life affected by prosthodontic appliances. This is because its reliable in nature and it has been translated in several languages.<sup>5,6</sup> This index is the most accepted parameter for analysing the impact of several variety of prosthodontic appliances including the prosthodontic appliances provided to the patients after treatment of oral and maxillofacial cancer. Although there has been various research programmes which has been carried out to assess the influence of world level problems like pandemic over different types of patients, but there are very few studies which has been conducted to analyse the condition of patients having dental prosthesis in the pandemic.<sup>7,8</sup>

The COVID -19 pandemic has started from China since the last phase of 2019. From then till now there is no aspect of human life which has been negatively influenced by this pandemic. It was found in the beginning in associated with the problems of the upper respiratory tract but later the virus was separated as novel beta coronavirus and it was considered as syndrome ( SARS-CoV-2).<sup>9,10</sup> This is severe acute respiratory syndrome coronavirus 2. Since then it has been classified as global pandemic by WHO. The mode of transfer of this virus from one person to another is through respiratory water droplets. It is also believed that one person infected with this virus can infect several new persons.<sup>11,12</sup>

It has been found that this virus can spread rapidly through aerosols and it can remain on surfaces for several days. According to WHO dental professional are at highest risk for contacting this virus because of aerosols being produced in several dental procedures. Hence the association of dentists of USA has recommended the postponement of all dental procedures except emergency dental treatment.<sup>13,14</sup>

As result the patients using denture prosthesis may be not clear about their future dental appointments regarding maintainence of dentures.<sup>15,16</sup> Therefore this study was carried out to analyse the influence of COVID-19 pandemic on patients using several types of prosthodontic appliances with the help of OHIP- 14 index.

## MATERIAL AND METHODS

The research took place between June 30 and October 30, 2020. Participants were chosen at random from those who had been treated with CDs, FPDs, IRDs, or IFPDs. A total of 129 patients volunteered to participate in the trial, making up the study population. Based on the 1-way ANOVA analysis ( $f=0.30$  at 80 percent power,  $\alpha=.05$ ), the selected sample size was enough to detect differences between the groups. During the phone calls, the patients were informed about the study's goal.

A structured telephone interview was conducted with their verbal consent, and their audio recordings were kept. The interviews were conducted by two independent dentists who had been educated by the study's researchers in reading the questions and recording the responses of the participants. The interviews were witnessed by an author (K.D.). Data was gathered using a three-part questionnaire. During the COVID-19 pandemic, the questions in the first section were designed to gather information on sociodemographic traits, oral healthcare habits, and the use of oral hygiene products.

The yes/no questions in the second section were aimed to reveal information about potential concerns about prosthesis care. The Turkish version of the OHIP-14 was used in the third section to evaluate the participants' quality of life during the COVID-19 epidemic. Functional limits, physical pain, psychological discomfort, physical disability, psychological disability, social impairment, and handicap are among the seven dimensions of oral health impact explored by the OHIP-14. On a 5-point Likert scale, items are assessed based on how frequently they have an impact (4=very often, 3=fairly often, 2=occasionally, 1=rarely, and 0=never).<sup>31</sup>

The total and individual domain scores for OHIP-14 range between 0-56 and 0-8, with higher scores indicating lower OHRQoL. The descriptive data were presented as frequencies (percentages), means, standard deviations, and medians using a statistical software programme (IBM SPSS Statistics) (25th to 75th percentile). The demographic data and yes/no replies were compared using the Pearson chisquare and Fisher's exact tests.

## RESULTS

When the patients were asked about the use of cleansing agent like that of sodium hypochloride vinegar for the purpose of cleaning dentures in the COVID -19 pandemic then the results were statistically significant. Patients using implant supported removable partial denture were found to use cleaning agent in maximum numbers.( Graph 1)

Once the patients were inquired about the need to carry out research regarding the maintainence and cleaning of their dentures then it was found that patients using implant supported fixed partial denture were maximum in percentage to carry out this research while patient using tooth supported fixed partial denture were found to be in minimum percentage. The results were statistically significant.( Graph 2)When the patients were inquired about the increase in necessity for cleaning their dentures during the COVID -19 pandemic then it was found that patients using implant supported removable partial denture were found to have maximum increase in necessity for cleaning of their dentures during the pandemic. The results were also statistically significant.(Graph 3)

The demographic data were analysed and it was found that the findings observed in frequency of brushing were statistically significant where it was found that most of the patients using implant supported removable

partial denture used to brush once a day while most of the patients using implant supported denture were found to brush 2-3 times a day. When the level of education was analysed then also it was found that findings were statistically significant. It was observed that most educated patients were found to use implant supported fixed partial denture in greater numbers. (Table 1)

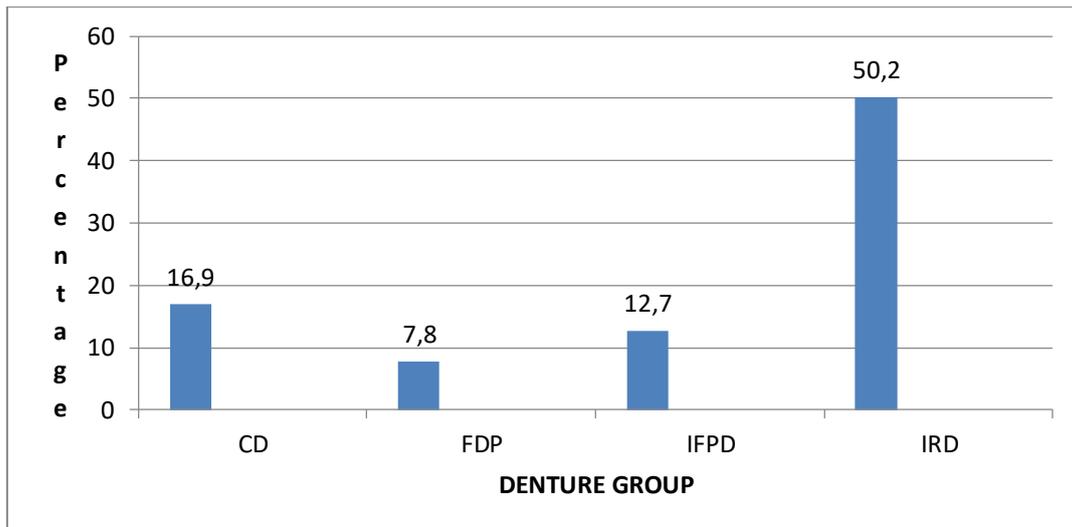
It was found that the maintenance of hygiene of the prosthetic devices and frequency of cleaning of the dentures was more during this pandemic. The incidence of functional limitation was more during pandemic and it was greatest in patients using implant retained removable dentures. It was also observed that patients were benefitted from the knowledge they gained from authentic literature sources in concern with adequate cleaning of prosthodontic appliances.(Table 2)

**Table 1. Demographic data**

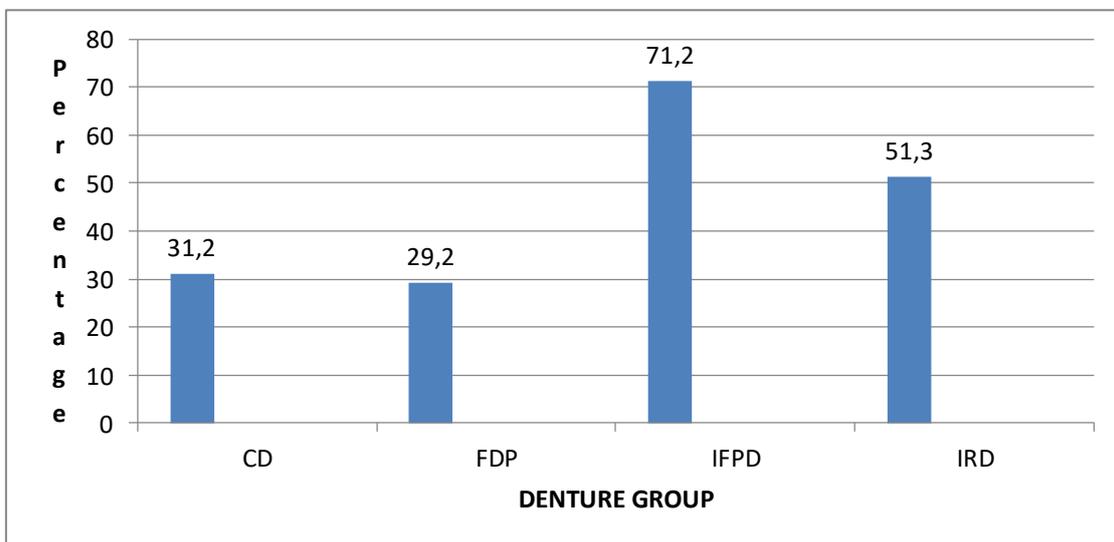
Variables	Denture Type				P value
	CD (n=51)	FPD (n=47)	IRD (n=35)	IFPD (n=30)	
<b>Sex</b>					
Women	58.6%	63.9%	65.3%	45.6%	0.72
Men	63.6%	58.3%	56.9%	76.6%	
<b>Age (years)</b>	71.3 ±22.4	58.9 ±8.1	72.8 ±6.0	63.1 ±8.7	<.001
<b>Frequency of teeth or denture Cleaning</b>					
<Once a day	31.1%	6.7%			0.001
Once a day	58.6%	58.3%	89.9%	35.2%	
2-3 times a day	43.6%	58.3%	5.3%	86.4%	
<b>Education</b>					
Primary school or less	68.6%	41.7%	48.6%	21.4%	0.001
Secondary or high school	41.1%	55.5%	61.1%	31.8%	
College or university	23.0%	36.1%	23.6%	71.1%	

**Table 2. Comparison of OHIP-14 ADD scores among denture groups**

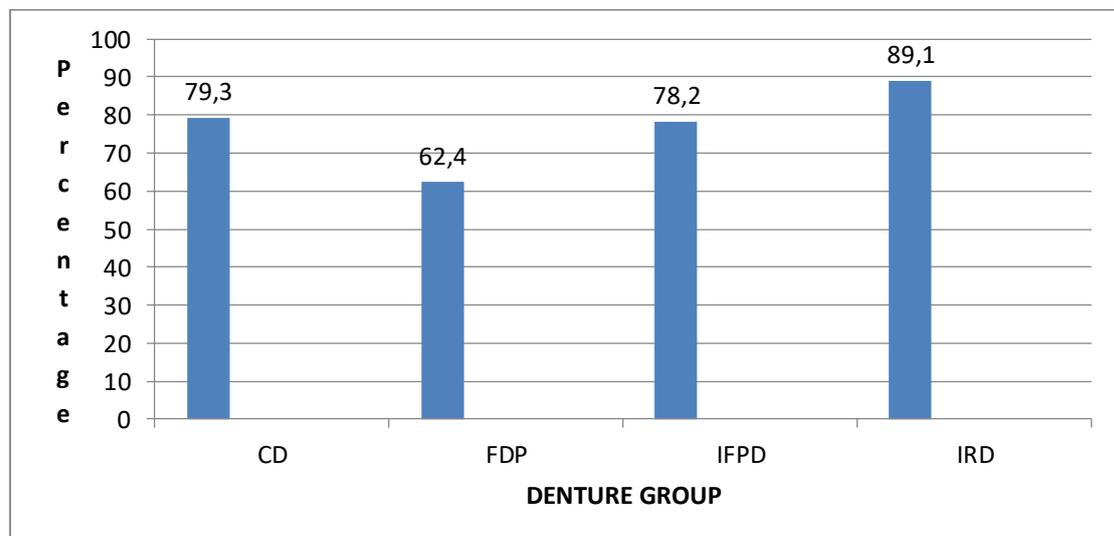
OHIP-14 Domain	Denture Type				P
	CD (n=50)	FPD (n=47)	IRD(n=35)	IFPD (n=30)	
OHIP-14 total score	7.84 ±6.59	6.62 ±6.85	7.49 ±4.28	5.28 ±3.80	.068
	(4-22.4)	(4-9)	(6-21)	(4-7)	
Functional limitation	0.84 ±1.05	1.01 ±0.95	2.65 ±2.43	0.63 ±0.68	.007
	(1-2)	(1-2)	(1-4)	(1-2)	
Physical pain	2.44 ±2.58	2.14 ±2.27	2.69 ±1.06	1.08 ±2.26	0.093
	(1-3)	(1-3)	(2-3)	(1- 2.5)	
Handicap	0.60 ±0.34	0.42 ±0.73	0.32 ±0.24	0.20 ±0.67	0.026
	(1-2)	(1-2)	(1-1)	(1-1)	



**Graph 1: The use of cleansing agent like that of sodium hypochloride vinegar for the purpose of cleaning dentures in the COVID -19 pandemic**



**Graph 2: The need to carry out research regarding the maintenance and cleaning of their dentures in COVID-19 pandemic.**



**Graph 3 : The increase in necessity for cleaning their dentures during the COVID -19 pandemic**

## DISCUSSION

Although there has been various research programmes which has been carried out to assess the influence of COVID-19 pandemic over different types of patients but there are very few studies which has been conducted to analyse the condition of patients having dental prosthesis in the pandemic.<sup>17,18</sup> The COVID -19 pandemic has started from China since the last phase of 2019. From then till now there is no aspect of human life which has been negatively influenced by this pandemic.<sup>19,20</sup>

In this study when the patients were inquired about the need to carry out research regarding the maintenance and cleaning of their dentures then it was found that patients using implant supported fixed partial denture were maximum in percentage to carry out this research while patient using tooth supported fixed partial denture were found to be in minimum percentage. The results were statistically significant. When the patients were inquired about the increase in necessity for cleaning their dentures during the COVID -19 pandemic then it was found that patients using implant supported removable partial denture were found to have maximum increase in necessity for cleaning of their dentures during the pandemic. The results were also statistically significant. The results observed in this study were in accordance with the results of some other studies carried during this pandemic.<sup>21-24</sup>

COVID-19 virus was found in the beginning in association with the problems of the upper respiratory tract but later the virus was separated as novel beta coronavirus and it was considered as syndrome ( SARS-CoV-2). This is severe acute respiratory syndrome coronavirus 2. Since then it has been classified as global pandemic by WHO.<sup>25,26</sup> The mode of transfer of this virus from one person to another is through respiratory water droplets. It is also believed that one person infected with this virus can infect several new persons. It has been found that this virus can spread rapidly through aerosols and it can remain on surfaces for several days.<sup>27,28</sup> According to WHO dental professional are at highest risk for contacting this virus because of aerosols being produced in several dental procedures. Hence the association of dentists of USA has recommended the postponement of all dental procedures except emergency dental treatment.<sup>29,30</sup>

It was found in this study that the maintenance of hygiene of the prosthetic devices and frequency of cleaning of the dentures was more during this pandemic. The incidence of functional limitation was more during pandemic and it was greatest in patients using implant retained removable dentures. It was also observed that patients were benefitted from the knowledge they gained from authentic literature sources in concern with adequate cleaning of prosthodontic appliances. When the patients were asked about the use of cleansing agent like that of sodium hypochloride vinegar for the purpose of cleaning dentures in the COVID -19 pandemic then the results were statistically significant. Patients using implant supported removable partial denture were found to use cleaning agent in maximum numbers.

The life quality of people can be improved by providing the dental prosthesis in patients suffering from missing teeth. This is achieved by restoration of functions of oral cavity and overall esthetics of the individual. In order to meet the requirements of different types of edentulous patients there are various prosthodontic treatment options.<sup>31</sup> These treatment options are meant for difference in the patients expectations and number of lost teeth. These treatment options are tooth supported fixed partial dentures, implant supported fixed partial dentures, tooth supported RPDs, implant supported RPDs, complete dentures and implant supported complete dentures.<sup>32</sup> When the demographic data were analysed then it was found that the findings observed in frequency of brushing were statistically significant where it was found that most of the patients using implant supported removable partial denture used to brush once a day while most of the patients using implant supported denture were found to brush 2-3 times a day. The results were not accordance with the study carried out by other authors. This is because change in the study population.<sup>33-35</sup>

When the level of education was analysed then also it was found that findings were statistically significant. It was observed that most educated patients were found to use implant supported fixed partial denture in greater numbers. A new index has been introduced to inquire about the prognosis of prosthodontic treatment modalities. This index is termed as OHIP-14 index ( Oral Health Impact Profile-14). This index is the most accepted index for analysing the quality of life affected by prosthodontic appliances. This is because its reliable in nature and it has been translated in several languages. This index is the most accepted parameter for analysing the impact of several variety of prosthodontic appliances including the prosthodontic appliances provided to the patients after treatment of oral and maxillofacial cancer.<sup>36</sup> This is why this index was used in this study to evaluate the quality of life associated with oral health in patients using prosthodontic appliances.

## CONCLUSION

It was concluded from the current study that the maintenance of hygiene of the prosthetic devices and frequency of cleaning of the dentures was more during this pandemic. The incidence of functional limitation was more during pandemic and it was greatest in patients using implant retained removable dentures. It was also observed that patients were benefitted from the knowledge they gained from authentic literature sources in concern with adequate cleaning of prosthodontic appliances.

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