

# Dental Status of Flood Affected and Internally Displaced Persons of Interior Sindh, Pakistan

Doua Tasleem Shaikh\*, Sikander Munir Memon\*, Aqsa Murtaza Jumani\*, Bakhtawar Ahmed Suhag\*, Uneza Hafeez Behrani\*, Muhammad Adil Memon\*

\* Department of Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Abstract-** To evaluate the oral health status and dental treatment needs of flood-affected and Internally Displaced Persons (IDPs) of interior Sindh, Pakistan. **Methods-** A descriptive cross-sectional study was done by the department of Community Dentistry, Liaquat University of Medical and Health Sciences, Jamshoro. The study participants included the flood-affected and internally displaced persons of Sindh. An oral examination was carried out using a portable light source and a wooden tongue depressor. Diagnosis of dental caries was done according to World Health Organization criteria and visual inspection was done to detect oral lesions/conditions. Treatment need of each individual was also evaluated. The data was recorded in a modified WHO oral health-assessment tool. **Results-** A total of 400 subjects were evaluated to examine dental and oral status, in which, the prevalence of dental caries was most abundant at 77.8%, while the DMFT score for caries was found very highly significant with p value of <0.001. Periodontal disease including gingivitis and periodontitis was evident in 31% and 23.5% respectively. The majority of patients needed preventive or routine dental treatment which was 54% while prompt treatment was needed by 22.5% and immediate treatment due to dental pain or infection was needed by 11.3% while only 2% of the individual were referred for comprehensive evaluation due to systemic condition. **Conclusion-** There was a high incidence of dental disease in individuals residing in interior areas of Sindh and they also had minimum access to seek dental treatment.

**Keywords-** Dental Caries, Floods, Oral Diagnosis, Oral Health, Pakistan, Periodontal Diseases

## I. INTRODUCTION

Dental diseases are considered as global health issue[1] and it has significant effects on daily life and social wellbeing of an individual[2], [3], moreover, it is proven that poor oral health adversely impacts systemic health[4]. The sequelae of chronic untreated dental diseases are often serious which may include severe pain, swelling and/or infection, which in turn, undermines quality of life and disrupts daily activities[5]. The high prevalence of oral diseases is more evident in third-world countries due to poor socio-economic status and dire living conditions of majority of its people[6], which forces them to neglect oral care and predispose to acquire detrimental oral habits like tobacco chewing[7] which results in major oral diseases[6].

Since the independence of Pakistan in 1947, its history is enriched with various records of displacement of huge human population. People in rural parts of Pakistan have worse oral health than those in urban areas, mostly because there are fewer oral health services

in rural areas and fewer people are aware of them due to low literacy rates[8]. Recently, Pakistan was hit by massive floods which caused mass displacement of people and there are estimated 33 million peoples from 81 districts affected by these heavy-rainfalls and floods, out of which 14 million people from 23 districts of Sindh are affected by floods and are forced to displace to other areas[9]. Internal mass displacement of people affects those who are being displaced as well as people who are living in host communities extensively, furthermore, they have a profound effect on community level as well as national level[10]. The displacement of individuals and their settlement in host areas creates massive issues for governance, financial burden, clean water supply, adequate sanitation and increased disease outbreaks and limited medical supplies, this demonstrates that mass relocation has a substantial impact on the public health. For example well-being of both displaced populations and their host communities[11]. The covering of IDPs is a challenging endeavor since IDP transfers expose them to new hazards and dangers[12]. Additionally, the arrival of IDPs in another town or area strains the local healthcare infrastructure, and the host population eventually takes on a portion of the difficulties experienced by the internally displaced[12].

The displacement leads to dire conditions of livelihood and inadequate supply of necessities, including lack of basic oral healthcare materials, which exposes them to extensive health risks[13]. Information of their oral health problems is limited. There is a need to determine their oral health status and treatment needs, Therefore, this study is designed to evaluate the dental needs of the IDPs, and the objective of this study is to evaluate oral health status and treatment needs of IDPs living in two areas of interior Sindh.

## II. METHODOLOGY

It was a descriptive cross-sectional study conducted by the department of Community Dentistry on the Internally Displaced Persons residing in the Matiari and Khanote districts of Sindh. The sample consisted of 400 individuals, ages ranging from 4 to 60 years. A WHO oral health assessment tool was modified, and data were recorded on it. The data was collected during a relief camp set up by the Liaquat University of Medical and Health Sciences, Jamshoro for the flood affectees and internally displaced individuals, living in the vicinity of Matiari and Khanote City. A written informed consent was duly signed by each individual. Participants were inquired about their demographic data and oral

habits. The subjects were asked to sit on a chair and their oral examination was initiated using a wooden tongue depressor and a portable light source. The procedure of the clinical diagnosis included the assessment of the presence of toothache, plaque, and gingival bleeding. The number of teeth with carious lesion were also counted and written as most of the individual had more than one carious lesion in their mouth. The presence or absence of periodontal diseases like gingivitis and periodontitis were also evaluated. The oral cavity was also checked for any suspected oral mucosal lesion and the patients with suspected oral lesions were inquired about the cause of the suspected lesion and quick counselling was provided for preventing further damage to the mucosa. The examination of the oral cavity also included the check-up of enamel fluorosis level, dental erosion, and the prosthetic denture status. All of the above data were noted in the questionnaire. The intervention urgency and treatment needs of the individual were also evaluated during this study. Data were analyzed using IBM SPSS Statistics for Windows, Version 22.0. Armonk. Frequency and percentage were calculated for the categorical variables. For continuous variables, mean, median, and SD were measured. The level of significance was set at  $p < 0.05$ .

III. RESULTS

A total of 40 participants were evaluated for their dental status. The demographic characteristics are shown in Table I. The study included 40% Males (n=160) and 60% Females (n=240) for gender distribution as shown in Table I.

Table I.

Variable	Frequency	Percent
<b>Gender distribution</b>		
Male	160	40
Female	240	60
Total	400	100
<b>District of the subject</b>		
Khanote	103	25.8
Matiari	297	74.3
Total	400	100.0
<b>Education level of the subjects</b>		
No Formal Education	63	15.8
Primary	200	50.0
Secondary	124	31.0
Graduate	13	3.3
Total	400	100.0

Table II: Dentition Status of Subjects (DMFT Score)

Age Group (years)	Mean	SD	Min.	Max.	P value
1 – 25	1.88	2.173	0	8	<0.001*
26 - 50	3.85	4.335	0	16	
> 50	12	0	12	12	

\*p-value highlights statistically significant difference between the different age groups.

One-way ANOVA test showed that there was a significant difference in dentition status (DMFT) against different age groups ( $p < 0.001$ ) as shown above in Table II. The chi-square test reveals a statistically significant relation for periodontal status in different age groups ( $p < 0.001$ ) in the following Table III.

Table III. Association of age groups of subjects with periodontal status

Age Groups (years)	Periodontal Status of the subjects			P value
	N	G	P	
1 - 25	108	36	9	<0.001*
	27.0%	9.0%	2.3%	
26–50	74	88	74	
	18.5%	22.0%	18.5%	
>50	0	0	11	
	0.0%	0.0%	2.8%	

\*Chi square Test \*p-value highlights statistically significant difference between the different age groups.

For Table III, N is the normal, G is the Gingivitis and P be the Periodontitis status of subjects.

The prevalence of caries was 77.8% (n=311) as given in Table IV. The periodontal status was found to be normal in 45.5% (n=182) of the total participants while 54.5% (n=218) had periodontal diseases as shown in Table IV. The presence of enamel Fluorosis was none in 75.5% (n=302) while 14% (n=56) had mild fluorosis, moderate fluorosis was 6% (n=24) and severe fluorosis was found in 4.5% (n=18) as given in Table IV. The individuals, devoid of dental erosion were 84% (n=336) and it was found in 16% (n=64) of the participants (Table IV). The majority of participants didn't use any type of removable denture which was 93% (n=371) while only 4.5% (n=18) participants use lower partial dentures and 2.8% (n=11) had upper removable dentures (Table IV). The percentage of participants who needed no dental treatment was 10% (n=4), while the majority of patients needed preventive or routine treatment 52.5% (n=21), prompt treatment was needed by 22.5% (n=9), immediate treatment due to pain or infection of dental and/or oral origin was needed by 12.5% (n=5) and the patients who were referred for comprehensive evaluation of medical/dental treatment due to systemic condition was only 2.5% (n=1) as given in Table IV.

Table IV.

Variable	Frequency	Percent
<b>Dental Caries status of the subjects</b>		
None	89	22.3
Present	311	77.8
Total	400	100
<b>Periodontal Status of the subjects</b>		
Normal	182	45.5
Gingivitis	124	31.0
periodontitis	94	23.5
Total	400	100

<b>Enamel Fluorosis Level of the subject</b>		
None	302	75.5
Mild	56	14.0
moderate	24	6.0
Severe	18	4.5
Total	400	100
<b>Dental Erosion of the subject</b>		
None	336	84.0
Mild	42	10.5
moderate	13	3.3
Severe	9	2.3
Total	400	100.0
<b>Denture Status of Subject</b>		
None	371	92.8
Upper Partial Denture	11	2.8
Lower Partial Denture	18	4.5
Total	400	100.0
<b>Intervention Urgency needed by the Subject</b>		
No treatment needed	40	10.0
Preventive or routine treatment needed	216	54.0
Prompt Treatment needed	90	22.5
Immediate treatment needed due to pain or infection of dental and/or oral origin	45	11.3
Referred for comprehensive evaluation or medical/dental treatment(systemic condition)	9	2.3
Total	400	100.0

#### IV. DISCUSSION

The national flooding of Pakistan has brought devastating effects on the people. Floods destroyed major infrastructure including hospitals and primary health care facilities[14], In addition, the worst possible living conditions of the affected led to an outbreak of diseases. In these conditions, dental health needs become subordinate and there is limited literature on the status of dental health.

Despite the importance of dental and oral health, it is considered a non-essential objective when dispensing emergency medical camps for any area[15] even though the evidence clearly suggests that oral and dental health have a huge impact on the general well-being of the individual[16], [17].

The present study was conducted in rural areas so, majority of the patients were illiterate (15.8%) or had only primary education (50%) and around 50% were unemployed or had odd jobs.

This cross-sectional study evaluated the burden of oral diseases on IDPs, the outcome of this study found that the oral health of IDPs is poor with the maximum prevalence of dental caries (77.8%) but this prevalence may not be associated with displacement, particularly as this result is comparable to the overall prevalence of dental caries at national level which is 60%,[18], the difference

between the results of these two studies may be due to the high incidence of dental caries in the selected population.

Another important finding from this study is that 54% of the individuals were suffering from periodontal diseases which is comparable to the results, reported by M. Nazir et al.[19] in his study, which reports that 50.3% of adolescents were suffering from periodontal disease. These periodontal diseases include gingivitis and periodontitis, 31% of the participants had gingivitis which is comparable to Nazir et al.[19] findings in which 33% of the individuals had bleeding on probing which is a prognostic marker of gingivitis. Another study conducted to assess the oral health status of urban slum dwellers by M F Habib et al.[20] reported that 22% of the individuals had gingivitis and 34% of individuals had periodontal pockets and periodontitis. The slight difference between the results may be due to differences in sample size and different sample selection techniques.

In many parts of Pakistan, the issue of high amounts of fluoride in the drinking water is of major concern and fluorosis is still an endemic disease that affects millions of people in different regions of Sindh, Balochistan, and Punjab. However, high fluoride in groundwater is a global issue, and 25 nations, including India, China, Sri Lanka, Spain, Italy, the West Indies, and the United States, are home to almost 200 million people who suffer from fluorosis, a horrible condition[21]. Our study reported that 25% of the participants had fluorosis.

It is also evident from this study that the majority of IDPs had at least one dental problem that could be rectified by carrying out simple preventive and routine dental treatment (54%), while 23% of the participants needed prompt and immediate treatment for the dental disease which is comparable to 30.6% of unmet dental treatment of IDPs in Nigeria[22]. Because of their dire living conditions, their access to dental care facilities is not only limited but also considered expensive, and in addition, the availability of oral care materials is a bare minimum and are regarded as high-priced.

#### V. CONCLUSION

Within the limits of this study, we can conclude that the oral health status of the IDPs is significantly poor, with a high prevalence of dental caries and periodontal infection. The limited access to dental treatment facilities is also a contributive factor in the abundance of dental diseases. The government should provide regular free dental check-ups and treatment to these vulnerable populations to enhance their health and well-being. The limitation of this study is a small portion of IDPs was evaluated, so further studies with a large number of IDPs are recommended.

#### Conflict of Interest

There is no conflict of interest.

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## AUTHORS

**First Author** – Doua Tasleem Shaikh, B.D.S, (M.Sc.) Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Second Author** – Sikander Munir Memon, B.D.S, M.Sc, Ph.D. Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Third Author** – Aqsa Murtaza Jumani, B.D.S, (M.Sc.) Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Fourth Author** – Bakhtawar Ahmed Suhag, B.D.S, (M.Sc.) Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Fifth Author** – Uneza Hafeez Behrani, B.D.S, (M.Sc.) Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Sixth Author** – Muhammad Adil Memon, B.D.S, (M.Sc.) Community Dentistry, Liaquat University of Medical and Health Sciences, LUMHS, Jamshoro, Pakistan.

**Correspondence Author** – Doua Tasleem Shaikh.