Oral Health Assessment in A Sample of Displaced People as A Result of The War on Syria In Damascus City: Results of Non-Profit Initiative

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Abstract

Background: War on Syria extended for a long time and which resulted in significant impacts on various aspects, one of these aspects was displaced people crisis, and thus its impact on complete neglecting of oral health despite of its importance and impacts on the general health. This study aims to assess the oral health of the displaced as a result of the war on Syria.

Materials and Methods: the sample included 118 patients of displaced families from different regions and cities to shelters in Damascus city and Damascus suburbs, and the study sample included 118 control samples whose data were collected from the Faculty of Dentistry - Damascus University. The working team included 20 dentists of all dental specialties. Oral health was assessed using DMFT index.

Results: the results showed that there were no statistically significant differences in the DMFT index value between children and adults, where the value of DMFT was (0-11) with a mean value (2.4), as the total value of DMFT between the two age groups was greater in adults' group than the children group. The total DMFT value for adults was (2.77), while for children (2.12). Statistical difference was noticed only in the numbers of missing teeth between the two age groups (P = 0.000), and there was no statistical difference between males and females in term of the DMFT value (P = 0.688).

Conclusion: This study concluded that the DMFT value is high among the displaced people as a result of the war on Syria.

Introduction

The war on Syria that began in 2011 had a great impact on various aspects inside Syria [1]. As the Syrian territories that were not subject to the Syrian state had become one of the most dangerous places for healthcare providers, and recent studies have found that hundreds of health care workers have been killed and / or tortured, and many health facilities have been destroyed [2]. Fouad et al 2017 found that during 7 long years of war on Syria, more than 6 million people have migrated inside Syria, in the largest displacement crisis in the world happened [3, 4], this is equivalent to six out of ten Syrians who have been displaced from their homes [5]. The displaced Syrians faced difficulties and obstacles in obtaining necessary health care and medicine in times of displacement [6]. Although the actual war on Syria ended nearly two years ago, and despite all the continuous measures taken by humanitarian organizations and governmental organizations to alleviate these difficulties and obstacles, there is still a group of displaced people present in the shelters until now due to their difficult economic conditions. [7, 8]

The war on Syria led as well that Oral health has also been completely ignored by the displaced, despite its importance and impacts on public health. This happened due to the complexity and relatively high cost of dental treatments, which made it very difficult for the displaced to obtain them [9]. According to research published in 2019 AD, the rate of tooth decay during the war in Syria was higher than expected, and the prevalence rate among children was 79.1%, with an average of DMFT (2.03). [10]

However, oral health is a very important indicator to a person’s general health status. [11] It also positively adds to a person's mental and social physical health [12, 13] Knowledge of the current state of oral health in one community has a great role in addition to its impact on any treatment or preventive interventions that can be widely adopted, whether in educational curricula and teaching strategies or even in oral health awareness programs [14, 15]

Dental caries consider one of the most common disease worldwide, and considers a public health problem in many countries [16]. Studies showed that poor oral health also leads to various systemic diseases such as cardiovascular and respiratory diseases [17, 18], in addition of being the number one cause of tooth loss worldwide [19]. The prevalence of dental caries varies between countries, as it is more prevalent in less developed countries due to poor socio-economic status [20], as well as environmental factors [21]. Therefore, it is important to study oral health on a sample of the displaced as a result of the war on Syria in Damascus.

Asnan-Lulu Initiative is a volunteer project within the Peace Organization that aims to examine oral health, provide dental treatments and raise awareness for the displaced people as a result of the war on Syria inside Damascus city by 20 dentists specialized in all dental specialties.

The aim of the research:

Evaluating the oral health of the displaced people (adults and children) as a result of the war on Syria within the city of Damascus through studying of the DMFT index and mentioning the number of treatments that have been provided (through the Asnan-Lulu Initiative).

Materials And Methods

study design:

A survey study to assess oral health, carry out treatment procedures, and raise awareness of oral health and tooth brushing for internally displaced people due to the war on Syria within the city of Damascus in two dental centers from October 2019 until November 2019.

Sample size:

The sample included 118 patients of displaced families from different regions and cities to shelters in Damascus and Damascus suburbs. Most of the patients in the sample were displaced from Yarmouk Camp and Deir Ezzor province, their ages ranged between 4 - 60 years (47% children under 13, 8% from 13-18 years old, 45% older than 18), 46.1% males and 53.9% Females.

The control sample also included 118 patients from the Faculty of Dentistry - University of Damascus, this considers a comprehensive and non-focal sample as people from all parts of Damascus city visit the external clinics of the faculty, thus ensuring randomness in data collection.

Inclusion criteria:

1- Internally displaced families to shelters holding identification numbers in Damascus and Damascus suburbs.

2- Internally displaced families to shelters who cannot afford dental treatments' costs.

Exclusion criteria:

1- Internally displaced families from their home to another home in another location.

2- Internally displaced families who have the financial ability to afford the dental treatments costs.

The team consisted of 20 doctors from all dental specialties (9 periodontics, 7 pedodontics, 2 endodontics, 1 prosthodontic, 1 oral medicine), where the oral medicine specialist diagnosed all patients and recorded each patient's data on his own diagnostic card (An adult or a child) then the specialist performed the required dental treatment and then made awareness about oral health. Oral health was assessed based on DMFT (Decayed, Missed, and Filled Tooth) index. All data were analyzed by a statistician.

Examination tools:

- Dental mirror.
- Explorer.
- Tweezers.
- Personal protecting equipment (PPE).

Results

The research sample consisted of 118 male and female patients from the displaced sample, whose ages ranged from (4–60 years), and the average age was (22.7 years). The number of males in the sample was 54 (45.7%), and the number of females 64 (54.3%).

The control sample also consisted of 118 patients who were identical in terms of demographic variables but were not internally displaced.

The sample was divided into two groups according to ages, the group of children (less than 14 years old), and the group of adults (older than 14 years) according to the recommendations of the World Health Organization (WHO) in the Directory of Medical Research in the field of dentistry, where the number of children reached 52 (44.1%), and the number Adults 66 (55.9%).

Oral health instructions were given to each patient (100%), they were instructed to the correct brushing method, the number of times and duration of brushing, in addition to oral habits that harm the teeth and how to avoid them.

Oral health was assessed using the DMFT index in the children and adults. The number of broken, repaired, and missing teeth was calculated, and the total value of the DMFT index was calculated. Where the value of the decayed teeth ranged between (0–5) teeth and the mean value were (0.9), the number of missing teeth ranged between (0–6) and the mean value was (0.8), while the number of restored teeth was between (0–5) with mean value. (0.7). The DMFT index value was between (0–11) with a mean value of (2.4). Table 1

Table 1
oral health assessment using DMFT index.

	N	Minimum	Maximum	Mean	Std.Deviation
Number of extracted teeth	118	.00	5.00	.9407	1.34795
Number of missing teeth	118	.00	6.00	.8390	1.33954
Number of filled teeth	118	.00	5.00	.7034	1.09630
DMFT index value	118	.00	11.00	2.4831	2.37772

The relationship between age and the value of DMFT was studied using Pearson's correlation test, and the test result indicated that there was no relationship between age and the value of the DMFT, as the value of the significance level was (P = 0.067). Table 2

Table 2
Correlations between Patient's age and DMFT value:

Variables		Correlation
Patient's age	Pearson Correlation	.169
	Sig. (2-tailed)	.067
	N	118

The level of oral health was studied according to age groups (children, adults). The value of carious teeth D was greater in the children's group (1.08), while it was in the adult group (0.83).

As for the missing teeth M, restored teeth F, and the total value of DMFT between the two age groups in the adult group, the total value of DMFT was greater in adults (2.77), while in children (2.12).

Only a significant difference was observed between the number of missing teeth between the two age groups (P = 0.000), while no significant difference was observed between the rest of the variables. Table 3

Table 3
DMFT value for each age group:

		Number of carious teeth	Number of missing teeth	Number of filled teeth	DMFT value
Age group	Children	1.08	.42	.62	2.12
	Adults	.83	1.17	.77	2.77
Statistical test	P value	**0.225**	**0.000**	**0.657**	**0.750**

Independent samples T-test was used to study the relationship between the value of the DMFT and the sex variable, and the test result showed that there is no significant difference between males and females in terms of the value of DMFT, as (P = 0.688). However, DMFT was higher for females than for males. Table 4

Table 4
Correlation between gender and DMFT

	Sex	N	Mean	Std. Deviation	Std. Error Mean	p-value	significance
DMFT value	Male	53	2.2830	2.44460	.33579	0.688	Not significant
	Female	63	2.6508	2.36342	.29776		

Numerous treatments were provided through the initiative, and the number of free treatments provided during the life of the initiative reached (203) treatments, as patients in total received a number of treatments ranging between (0–6), and the mean value was (1.7), as each patient received At least two treatments, in addition to awareness and topical application of fluoride, if necessary.

The largest number of treatments provided was restorative treatments (59) treatments, followed by treatments with tooth extraction (54), where the team tried to preserve the teeth by restoring them, but as noted from the table, a large number of treatments were extractions, because the teeth were not restorable due to bad Oral hygiene. Table 5

Table 5
Mean and Std. Deviation of treatments:

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Total numbers of treatments	118	.00	6.00	203.00	1.7203	1.55737
Extraction	118	.00	4.00	54.00	.4576	.91188
Restorative treatments	118	.00	3.00	59.00	.5000	.84479
Endodontics and restorative treatments	118	.00	3.00	32.00	.2712	.60850
Pulpotomy	118	.00	5.00	14.00	.1186	.57244
Scaling and root planning	118	.00	1.00	44.00	.3729	.48563
Awareness	118	1.00	1.00	118.00	1.0000	.00000
Fluoride application	118	.00	1.00	41.00	.3475	.47819

The total number of Scaling and root planning procedures, endodontic treatments, and pulpotomy was (44, 32 and 14), respectively.

118 people were studied to compare the DMFT with a sample of displaced families, the data for comparing sample were collected from external clinics of the faculty of dentistry, where large number of patients come from different areas of Damascus the capitol, thus the randomization and non-focal is granted during data collection. Table 6

Table 6
Correlation between age and gender with treatments

			Total numbers of treatment	Extraction	Restorative treatments	Endodontic and restorative treatments	Pulpotomy	Scaling and root planning	Awareness		Fluoride	
									no	yes	no	yes
Age group	children	Male	1.29	.29	.46	.11	.36	.07	0	28	12	16
		Female	1.25	.42	.58	.04	.17	.04	0	24	4	20
	adults	Male	2.00	.84	.28	.20	.00	.68	0	25	25	0
		female	2.23	.38	.64	.59	.00	.62	0	39	34	5

Table 7 shows the number of each value of DMFT index in the control sample, as the mean value was (2.37), and ranged between (0–10). Mean value of extracted teeth was (1.8), filled teeth (3.43), missing teeth (1.75).

Table 7
oral health assessment using DMFT index for control sample

	N	Minimum	Maximum	Mean	Std. Deviation
Number of extracted teeth	118	0	4	1.8	1.23
Number of missing teeth	118	0	3	1.75	1.43
Number of filled teeth	118	0	19	3.43	0.98
DMFT value	118	0	22	2.37	1.4

Table 8 shows the result of independent samples T-test to study the existence of a statistical difference between each of the displaced sample and the control sample in terms of DMFT index, the test showed there was no statistical difference between each of the displaced

sample and the non-displaced sample as (p = 0.087), but the displaced sample showed a higher DMFT index value leading to a lower level of general oral health comparing to non-displaced sample.

Table 8
significant difference between displaced sample and control sample?

	Mean	Std. Deviation	p-value	significance
Displaced sample	2.37	2.48	0.087	Not significant
Control sample	1.4	2.37		

Discussion

The importance of this research comes from evaluating the DMFT index in displaced people from all different ages, several studies conducted about this index in children till age 15, in addition that the information discontinued about this index for older ages in 2000 after Bieruti study 2001 [22].

Therefore, it was necessary to carry out this study to find out the impact of the war on Syria on the oral health of displaced adults, in addition to comparing the information that we had with the existing information on the DMFT index in children.

In this study, the average value of the total DMFT indicator in adults was (2.77), while in children (younger than 14 years) (2.12), which is higher than the rate recommended by WHO. [23]

There was no significant difference in the value of DMFT between the sexes, except that the value of DMFT was higher in females compared to males.

A study DMFT values for two decades in Syria from 1980 to 1999 by Beiruti and Tayfour showed that were for children aged 5 years (4.7–5.2), and for children aged 12 years (1.9–2.3); Where these values of DMFT are lower compared with the values of DMFT in this study, which recorded a total value in children (2.12). [22]

In a 2019 study of oral hygiene in Syria carried out by Aster, the DMFT values for children aged 5 years in 2011 were (8.6), while children aged 3 years in 2013 were (6.1); These DMFT values are higher compared to the DMFT values in this study, which recorded a total value in children (< 14 years) (2.12). [24]

In a comparative study between DMFT values and the economic situation in Syria in 2019, conducted by Al-Haffar and others, the results were in children of 12 years old (3.36); These DMFT values are higher compared to DMFT values in this study which recorded a total value in children (< 14 years) (2.12). [25]

An oral health study in Damascus during the war in Syria in 2019, carried out by Al-Blog and Dash in children 8–12 years old, showed DMFT results (2.03 ± 1.81); These DMFT values are lower compared to the DMFT values in this study, which recorded a total value in children (< 14 years) (2.12). [10]

a study in Lattakia in 2013 by both Sultan and Salman, the values were as following for children aged 15 – 13 years, the DMFT was ((2.35); while the value of DMFT in this study for children (less than 14 years) was (2.12). [26]

In a study in Damascus in 2009 by Dashash, the values were as following for children aged 5 years, the dmft (3.27); While the value of DMFT in this study in children (less than 14 years old) was (2.12). [27]

And in a study in Syria in 2008 by both Hindawi and Qushji, the values were as following: Children aged 6–7 years were the dmft (3.13), children aged 6–7 years old, the DMFT was (0.05; while the value of DMFT in this study was in children) Less than 14 years) (2.12) [10]

While comparing the results of this study with the studies conducted in the Arab world, we find:

A study in Dubai in 2013 by Al-Mashhadani and Khoury showed the following values: Children aged 6 – 5 years The dmft was (3. 87), children aged 12–15 years old, the DMFT was (1.83; while the value of DMFT in this study was in children (Less than 14 years) (2.12). [28]

Comparing the results of this study with studies conducted in other countries of the world, we find: a 2014 study in India by Kumar S et al. The values in children aged 15 – 12 years were DMFT (4.82), while in this study the value of DMFT in children (less than 14 years)) was

(2.12).[29]

Most of the treatments were provided in the initiative were restorative treatments and extractions, the number of restorative treatments reached (59) treatments, followed by extractions (54) treatments, as an attempt was made to preserve the teeth by restoring them, while the teeth that needed extraction it was due to the long period of poor oral hygiene that the patients suffered of, and this indicates the depth of suffering experienced by individuals and the resulting oral health neglecting.

Conclusion

This study concluded that the DMFT value is high among the displaced people as a result of the war in Syria.

Recommendations and suggestions:

1) Emphasizing the importance of oral health for individuals.

2) Cooperating with schools and institutions that deal with children to provide the best oral and dental health awareness services.

3) Cooperating with associations and institutions that deal with displaced people to provide the best oral and dental health awareness services.

4) Providing preventive treatments and applying fluorinated materials to protect teeth from decay.

5) Adopting a preventive and awareness-raising educational program.

6) Emphasizing the role of parents in teaching and spreading health awareness among their children, and focusing on the importance of educational achievement for children.

7) Establishing a specific formula for cooperation between Damascus University, the Ministry of Education and the Ministry of Health to raise awareness among children.

8) Conducting additional oral health studies.

Declarations

Ethics approval and consent to participate

Ethical approvals were obtained from the ethics committee of Damascus university – Syria, which approved the research including patient. In addition to that, all methods were performed in accordance with the relevant guidelines and regulations ('Sex and Gender Equity in Research – SAGER – guidelines').

Informed consent was obtained from all patient before the enrolment in the study and before the diagnosis and the treatment phase, informed consent was obtained from the parents or the legal guardian of the participants under 18 years.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors have contributed equally to the conception and design of the work; and to the acquisition, analysis, and interpretation of data. All authors read and approved the final manuscript.

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