

The Effect of Internal Displacement of Syrian Refugees on Gingival Status

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Abstract: Background: *Gingiva plays a great role in protecting and preserving the teeth, so controlling plaque and oral care is a necessity to reach good oral health that protects against gingiva and periodontal diseases.* Aim: *This research aims to assess the impact of migration and internal displacement of the Syrian refugees on their gingival status through the study of their Oral Health Indexes. Promoting the importance of oral health care and teaching those ways and multiple means to upgrade their awareness.* Methodology: *A cross-sectional study of a random sample of 1090 students that was included (631 non-refugees, 307 refugees living in regular homes, 152 refugees in shelter homes). They filled out a questionnaire that includes some of the proposed risk factors (refuge and place of residence) and were examined based on dental plaque index (PI), gingival inflammation (GI), and simplified oral hygiene (OHI-S). Chi-Square test was used at the level of significance $0.05 \leq P$ statistical study.* Results: *The current study showed that the level of Oral Hygiene (OHI-s) in the refugees in shelters was lower than each of the other groups, and showed that the incidence of gingivitis in this group (84.2%) was greater than the refugees in regular homes (74.3%) and non-refugees (72.7%).* Conclusion: *High prevalence of gingival inflammation and poor oral health when the refugees living in shelters, compared with the refugees in regular homes and non-refugees. Dental plaque, poverty, and psychological factors played an important role in increasing the spread of gingival inflammation among students in this crisis.* Clinical Significance: *Knowing the gingival status of refugees in order to provide them with assistance in order to raise the level of oral care.*

Keywords: Gingival inflammation, Internal Displacement, Oral Hygiene, Refugees

1. Introduction

It has been long promoted the increasing risk of destructive periodontal diseases caused by psychological disorders, early studies have showed higher prevalence of these diseases amongst people with specific psychological cases (1). Marcenes has found relations between work stress and gingival status(2), Green also found a relation between stressful life incidents and the degree of periodontal disease(3). People with psychological disorders had more prevalence of gingival diseases(4), Psychological stress also affects the response level to periodontal treatment(5), In Sweden Johannsen found that daily life stress was related with bad effects on gingival status(6).

Multiple studies stated high relevance between financial and social level and the presence of gingival disease, Drury evaluated financial and social status of subjected people in regards of their education, and their families income and found higher presence of gingival bleeding and loss of attachment greater or equal to 04mm amongst people with low social and financial levels(7). Aass had found after examining Norwegian students at the age of 14 higher presence of radiological bone level loss among those with lower social and financial levels(8), Similar results were found among chili students with regards attachment level loss greater or equal to 3 mm(9).

Locker has also found that Canadian children had better oral health status and less presence of gingivitis compared to those immigrants with lower financial and social levels in Ontario(10), Andres study has showed that immigrants had 98% gingivitis and 85% periodontitis which were higher

than Canadian society index rates(11). In 2015 a study on 13 poor cities in Brazil has showed relations between gingivitis among teenagers, and demographic and financial status(12), Another study in Brazil has showed the contra relation between gingivitis and the kids awareness of their oral hygiene and daily life(13).

Sothis research aims to assess the impact of migration and internal displacement of the Syrian refugees on their gingival status through the study of their Oral Health Indexes. Promoting the importance of oral health care and teaching those ways and multiple means to upgrade their awareness.

2. Materials and Methodology

2.1 Study population

Controlled randomization has been used to choose 1090 students. 34 students were not examined and then excluded due to the following reasons (04 have refused to be examined, 03 non Syrians, the rest due to orthodontic treatment). The rest had filled a survey and were orally examined.

The study group was divided into 03 groups depending on their residence status:

First group: nonrefugees - 631

Second group: refugees living in regular homes - 307

Third group: refugees in shelter homes - 152

Exclusion criteria

Non Syrian students, students with diseases that have increasing effects on gingivitis (diabetes and blood diseases), current orthodontic treatment, which increases plaque compilation and triggers gingivitis.

Clinical examination

A brief simple explanation about this research was given and ethical clearance and informed consent was taken to collect medical and oral history of each participant.

Certificate of consent

Study title: The Effect of Internal Displacement of Syrian refugees on Gingival Status

I confirm that I have read and understood the information sheet for the above study and have had an opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time without having to justify my withdrawal and without my medical care or rights as a patient being affected.

I understand that certain sections of my medical notes may be looked at by certain individuals or authorities for the purpose of this research. I give permission for these individuals to access my medical records.

I have been given an opportunity to ask questions and my questions have been answered satisfactorily.

I agree to take part in this research.

I understand that I will be given a copy of the signed consent documents.

Research Participant:

Name: Signature: Date: Time:

Researcher:

Name: Signature: Date: Time:

Information about the ratio of tooth brushing on daily basis, the method of tooth brushing was also collected and filled in dedicated forms. Oral examination was conducted by periodontist with the use WHO gingival probe and result were recorded for periodontal indices. Plaque index(14), gingival index(14), simplified oral hygiene index (OHI-s)(15). At the end of the examination student were tutored how to best use a tooth brush. The importance of dental floss, mouth rinse, and periodical dentist visits to ensure good oral health status, free toothbrushes and toothpaste were handed out to enhance oral care.

Statistical study

Descriptive study for the suggested risk factors and the relation between them and gingivitis through statistical analysis was carried out, These analysis's were descriptive analysis and conclusive analysis to accept our theory or reject it at a value of $p \leq 0.05$ (Kruskal-Wallis, Mann-Whitney U, Chi-Square).

3. Results**Study population**

It consisted of 1124 male student from Damascus high schools, aging 15-18 years old. 34 students were excluded in

accordance to exclusion criteria. They were divided into three main groups depending on their refuge status. (Non refugees / Refugees living in regular homes / Refugees in shelter homes). The distribution of the study groups with accordance to the refuge status, the place of residence, and age was as below Table (1). Plaque index, gingivitis index, and oral health index each was tested, evaluated and recorded for the Study groups in accordance to the refuge status. Table (2)

To study the effect of refuge and home status in each index Kruskal-Wallis test for median differences has been applied. Table (3) indicates that p value was lower than 0.05 regardless of the subject taken. This means at (p value) 95% there were significant statistical differences in the means of each one of these indexes between at least two of the study groups.

To find which of these groups differ the most in these indexes, Mann-Whitney U test has been used, the table (4) has showed dual comparisons studied where noted that the level of significance value smaller than the value of 0.05, That is when the 95% confidence level are no statistically significant differences in the average values of each of the dental plaque index PI and gingivitis index GI and oral hygiene index OHI-s among refugees in shelter homes and all of the refugees living in regular homes and non-refugees in the research sample, by studying the average of grades and means of the values we conclude that the values of each of the dental plaque index PI and gingivitis index GI and oral hygiene index OHI-s in a group of refugees in shelter homes was the largest of them in each of the refugees living in regular homes and non-refugees separately.

4. Discussion

In this study oral and gingival health status among adult refugees and non-refugees was evaluated, the study included 1090 student at the age of 15-18 from different high schools in Damascus and they were divided into 03 main groups, refugees living in shelters, refugees living in regular homes, and non-refugees. The study has showed a plaque index median of 1.45 among students living in shelter homes, 1.29 median for refugee students living in regular homes, and 1.32 median for non-refugee students. Gingivitis index median for the same groups was 0.85, 0.66, and 0.72 in the same order. Simplified oral hygiene index median was 1.72, 1.54, and 1.56 in the same order as well. After comparison between each of these medians, no significant differences were found between each of these groups (refugees living in regular homes and non-refugees), as for other bilateral comparisons we derived that the plaque index, gingivitis index, and simplified oral hygiene index for refugee students living in shelter homes was greater than the other 2 groups. We found a strong relation between plaque index, gingivitis index, and simplified oral hygiene index regardless of refuge status. The limitations of this study are the difficulty of explaining research and conducting an oral examination within the school classroom in terms of the ability to control students.

This indicates the role of dental plaque as risk factors for periodontal diseases. This concurs with many studies

like(16-18) which linked dental plaque to the increasing of periodontal diseases. It also concurs with other studies that have indicated that the presence of dental plaque is the primary initiative of periodontal diseases. Keeping in mind other factors that have a role in this like genetic, demographic, financial, social, behavioral factors(19-21). Studying the relation between the period of time of refuge and periodontal indexes, we found no relation between it and any of the plaque, gingivitis, simplified oral hygiene indexes in each of these groups. The study has showed 84.2% prevalence of gingivitis among refugee students living in shelter homes. This was greater than the 74.3% among refugee students living in regular homes and the 72.7% among non-refugees. This indicates the role of refuge and place of residence (psychological and social factors) on increasing gingivitis, which agrees with multiple studies(11-13, 22-24), Andres(11) stated that gingivitis prevalence was at 98% among immigrants, which was higher than percentages among Canadian society. There were no significant differences for the prevalence of gingivitis between refugees living in regular homes and non-refugees. There were no significant differences for the period of time of refuge between subjects with gingivitis and subject without gingivitis regardless of their refuge status. This incur that the period of time of refuge is not related to gingivitis among refugees.

5. Abbreviations

GI: gingival index;

PI: plaque index;

OHI-s: simplified oral hygiene index;

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Table 1: Show the distribution of the study groups with accordance to the refuge status, the place of residence

percentage	individuals	refuge status and residence status
13.9	152	refugees living in shelters
28.2	307	refugees living in regular homes
57.9	631	Non-refugee
100	1090	Total

Table 2: Show mean, standard deviation, standard error, the minimum and the maximum for each of PI, GI, and OHI-s each was tested accordance to the refuge status and residence status

maximum	minimum	Standard error	Standard deviation	mean	individuals	refuge status and residence status	Studied variable
3	0	0.04	0.52	1.45	152	refugees living in shelters	Plaque index PI
3	0	0.03	0.53	1.29	307	refugees living in regular homes	
3	0	0.02	0.57	1.32	631	Non-refugee	
2.5	0	0.06	0.72	0.85	152	refugees living in shelters	gingivitis index GI
3	0	0.04	0.66	0.66	307	refugees living in regular homes	
2.5	0	0.03	0.72	0.72	631	Non-refugee	
3	0	0.05	0.63	1.72	152	refugees living in shelters	oral hygiene index OHI-s
3	0	0.04	0.63	1.54	307	refugees living in regular homes	
3	0	0.03	0.67	1.56	631	Non-refugee	

Table 3: Show test results Kruskal-Wallis

Significance differences	The value of significance level	Chi-square value	Grades' average	individuals	refuge status and residence status	Studied variable
<u>available</u>	0.008	9.598	613.14	152	refugees living in shelters	Plaque index PI
			519.23	307	refugees living in regular homes	
			541.99	631	Non-refugee	
<u>available</u>	0.012	8.805	611.72	152	refugees living in shelters	gingivitis index GI
			524.77	307	refugees living in regular homes	
			539.64	631	Non-refugee	
<u>available</u>	0.008	9.635	613.95	152	refugees living in shelters	oral health index OHI-s
			520.32	307	refugees living in regular homes	
			541.26	631	Non-refugee	

Table 4: Show test results Mann-Whitney U

Studied variable	Refuge status and residence status	Refuge status and residence status	valueU	The value of significance level	Significance differences
Plaque index PI	refugees living in shelters	refugees living in regular homes	19204.5	0.002	<u>available</u>
		Non-refugee	41801.5	0.012	<u>available</u>
	refugees living in regular homes	Non-refugee	92920	0.302	Non available
gingivitis index GI	refugees living in shelters	refugees living in regular homes	19513.5	0.003	<u>available</u>
		Non-refugee	41709.5	0.0102	<u>available</u>
	refugees living in regular homes	Non-refugee	94311.5	0.5	Non available
gingivitis index GI	refugees living in shelters	refugees living in regular homes	19207	0.002	<u>available</u>
		Non-refugee	41676.5	0.011	<u>available</u>
	refugees living in regular homes	Non-refugee	93252.5	0.346	Non available