**Title :** Contemporary place of orthodontics in public health improvement in Algeria

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**Abstract:**

Orthodontics and dento-facial orthopedics are fields of modern dentistry that aim to study dental and facial growth, to diagnose malocclusions and to treat them. The orthodontics contribution to public health has been debated by the pioneers of the field in the sixties.
However, this subject has reemerged in the last years because of the high demand for orthodontic treatment in modern societies. Word Health Organization recommended that the public policies must support the orthodontics role in health promotion and life quality amelioration. So is there a real impaction of malocclusion and orthodontic treatment on the quality of life?
In this paper, we will try to answer this question through 10 clinical cases presentation showing patients who were suffering from malocclusions and teeth crowding before and after treatment. Questionnaires (OHRQoL) were distributed to these patients in order to evaluate their perception of the changes before and after treatment.
In conclusion, comfort when eating, sleeping and engaging in social interaction, in self- esteem and satisfaction are usually affected by malocclusions. Orthodontics can help to improve all these aspects of public health in modern societies.
**Keywords:** Orthodontics, public health, life quality, malocclusion, Algeria.

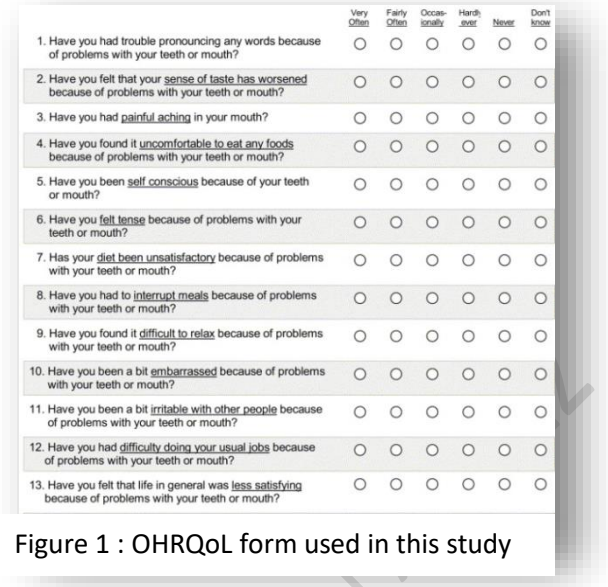
NOUR CSEPHS-JANUARY 16-17 2022

## I. Introduction:

If the earliest description of irregularities of the teeth was given about 400 bc by Hippocrates (ca 460-377 bc), the modern orthodontic appliances description did not appear until the XVIII$^{th}$ century thanks to Pierre Fauchard in France (1). Since then, the contribution of orthodontics in public health was discussed by clinicians with different backgrounds.
Nowadays, the role of orthodontics in malocclusions diagnosis and treatment is not discussed anymore. In some countries, public health services has been obliged by law to include orthodontics for all ages up to 17 years completely free of charge (2) as a recognition of its place in human health improvement.
For the same reasons, Word Health Organization recommended that the public policies must support the orthodontics role in health promotion and life quality amelioration.
In this paper, through 10 clinical cases, the role of orthodontics in quality of life improvement is highlighted.

## II. Methods:

Our dental department is located in the city of Ouargla (800 Km southeast the capital city of Algeria). Orthodontic care is provided by two orthodontists only in the city. In 2019, 837 orthodontic treatment requests have been received in the department. In the actual study, 10 patients were randomly selected to be presented and to be evaluated by the Oral Health Related Quality of Life (OHRQoL) form (Fig 1) before and after treatment.



| | Very Often | Fairly Often | Occas-ionally | Hardly ever | Never | Don't know |
|---|---|---|---|---|---|---|
| 1. Have you had trouble pronouncing any words because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 2. Have you felt that your sense of taste has worsened because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 3. Have you had painful aching in your mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 4. Have you found it uncomfortable to eat any foods because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 5. Have you been self conscious because of your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 6. Have you felt tense because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 7. Has your diet been unsatisfactory because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 8. Have you had to interrupt meals because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 9. Have you found it difficult to relax because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 10. Have you been a bit embarrassed because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 11. Have you been a bit irritable with other people because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 12. Have you had difficulty doing your usual jobs because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |
| 13. Have you felt that life in general was less satisfying because of problems with your teeth or mouth? | ○ | ○ | ○ | ○ | ○ | ○ |

Figure 1 : OHRQoL form used in this study

## III. Results:

After follow ups varying from 12 months to 24 months depending on the malocclusion severity, the 10 cases showed the following improvements:

### A. Clinical cases:

1. **Case n°1:** B.A 10 year-old girl suffering from early loss of lacteal teeth and early signs of crowding and mandibular retrognathia (Fig 2).

Figure 2 : Clinical case n°1 improvement

2. **Case n°2 :** A.R 10 year-old girl referred for oral breathing signs. After tonsillectomy and nasal breathing learning exercises, the patient recovered and facial growth improved (Fig 3).

Figure 3 : Clinical case n°2 improvement

3. **Case n°3 :** B.S 9 year-old girl referred to us for retention of the upper incisor. After surgery, the upper incisor has been placed in its correct position improving patient's self-esteem (Fig4).

Figure 4 : Clinical case n°3 improvement

4. **Case n°4 :** B.S 9 astication syndrome (etiology of facial asymmetry in the adulthood). The early loss of the lacteal teeth on the left side was identified as the main cause. Eruption guidance appliance helped to manage the case in one year (Fig 5).

Figure 5 : Clinical case n°4 improvement

5. **Case n°5 :** A.A 11 year-old boy referred to us for upper jaw protrusion. 18 months treatment with fixed appliance allowed to put the upper jaw in correct position according to the lower jaw with an excellent esthetic result (Fig 6).

Figure 6 : Clinical case n°5 improvement

6. **Case n°6 :** F.A 11 year-old boy diagnosed as class II/2 malocclusion with dental trauma due to upper incisors protrusion. Preformed activator ameliorated the dental conditions (Fig 7).

Figure 7 : Clinical case n°6 improvement

7. **Case n°7 :** C.A 7 year-old boy diagnosed with lateral shift of the mandibule. The upper jaw expansion allowed the mandibule to find new references (Fig 8).

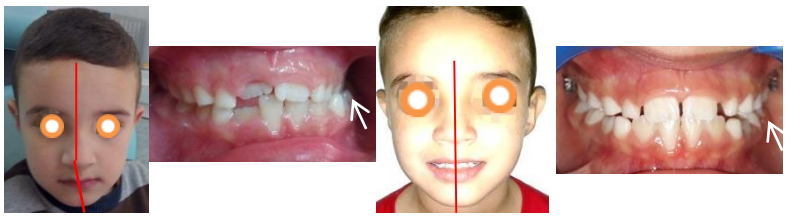


Figure 8 : Clinical case n°7 improvement

8. **Case n°8 :** T.A 12 year-old taking in charge for severe crowding. Fixed appliance with first bicuspids extractions improved the teeth alignment in 24 months (Fig 9).

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Figure 9 : Clinical case n°8 improvement

9. **Case n°9 :** S.H 12 year-old girl referred to us for estheitc complaint. Fixed appliance ameliorated teeth alignment in 6 months (Fig 10).

Figure 10 : Clinical case n°9 improvement

10. Case n°10 : L.R 8 year-old girls referred for early signs of cowding. Eruption guidance for 18 months allowed all teeth to take place normally on the two jaws (Fig 11).

Figure 11 : Clinical case n°10 improvement

**B. OHRQoL :**

The OHRQol form has 14 components from different domains.

In the forms received before treatment, malocclusions seem to impact especially self-esteem domains represented by the 5$^{th}$ and the 10$^{th}$ component of the form (Fig 12).

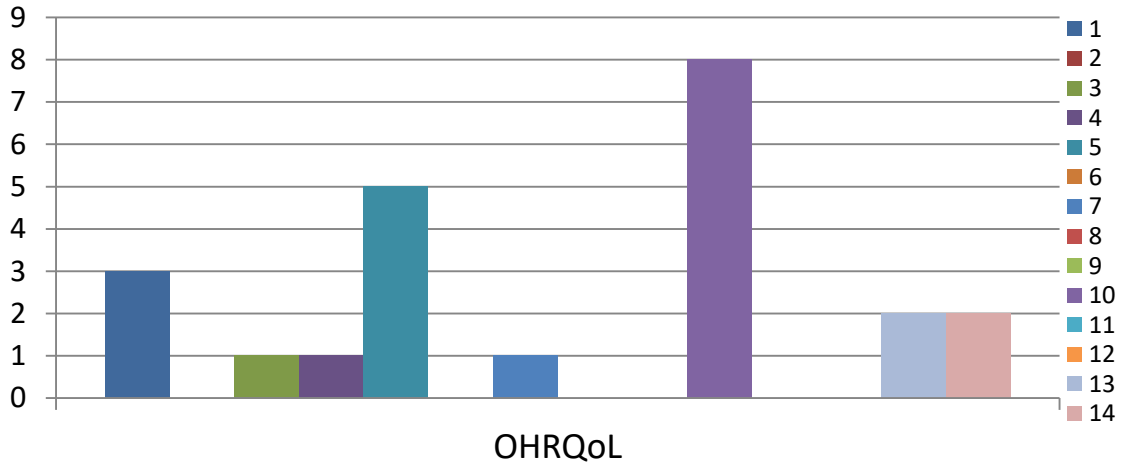


Figure 12 : OHRQoL evaluation results before treatment

## IV. Discussion :

Children from 8 to 12 years old participated in this pilot study.
Different complaints were reported, but the esthetic complaint remains the most frequent.
OHRQoL before treatment was marked by high proportion of children felt embarassed (80%) and self-consious (50%) by their teeth condition.
The emotional criteria in OHRQol improved following orthodontic treatment of all the patients of the group.
Similar results have been reported in the study of Farzanegan et al. (3). They have noticed an amelioration of quality of life at the same time of orthodontic treatment progression.
The same findings have been reported by Jaeken et al. (4) in 215 cases study.
These facts can be noticed easily by health professionals through the pictures of the presented clinical cases in this paper. Various orthodontic treatments are proposed to achieve the results noticed in these patients.
Eruption guidance appliances have been used in three cases, fixed appliances in three cases and surgery in 2 cases depending on patients' diagnosis. But better stability and functional outcomes were noticed with eruption guidance appliances (when they are indicated). Boukhazani (5) has mentioned these outcomes in a class II/1 malocclusion report.

## V. Conclusion :

Orthodontic treatment contribution in the improvement of emotional domains of OHRQol is confirmed in the actual pilot study.
It helped also in masticatory function amelioration.
The orthodontic care needs to be a part of public health policies especially in children due to its positive impact on both emotional and functional well-being.

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