Study regarding the correlation between the Child-OIDP index and the dental status in 12-year-old children from Harsova, Constanta county

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Summary

The assessment of the individuals' Oral Health Related Quality of Life is commonly made by the socio-dental indices, used in the same time and compared with the clinical indices of oral health.
The Child Oral Impacts on Daily Performance Index is used for planning the community oral health programs for children.
The aim of this study is the evaluation of the Oral Health Related Quality of Life in the 12-year-old children from Harsova (Constanta district), by the use of Child-OIDP Index, and to compare this relation with the real oral health status of the subjects, appreciated by the DMFT and OHI-S indices, and by the registration of the dento-maxillary anomalies and the presence of fluorosis.
The results of the study show that the general score of the impacts of the oral condition on the life quality of the subjects is 64.95%. Even though this value seems not to be related with the DMFT index (2.59), it is related with the poor oral hygiene (OHI-S = 2.8) and the high prevalence of the dento-maxillary anomalies (58.97%).
To conclude, we can say that the prevalence of the impacts of the oral condition on the daily performances of children increases with the decrease of their severity. In the same time, the impacts intensity decreases with the increase of the number of the affected performances.

Keywords: socio-dental indices, oral health related quality of life, child-oral impact on daily performances.

Introduction

Only in recent years, the relationship between the quality of life and oral health was given the attention it deserves.

Oral Health Related Quality of Life has become a priority for specialists as late as the 1980's, and then they focused on evaluating the consequences of oral disease on the life of the individual and the establishment of proper measures in order to cancel the negative effect of oral disease on the quality of life [9].

Nowadays the evaluation of the relation between the quality of life and oral health is a major issue in the health policies of the developed countries [10].

The quality of life sums up several factors and variables, both medical and non-medical.

The relation between the quality of life and oral health is defined as the evaluation, both from a personal and a medical point of view, of the way in which functional, psychological ("the looks" and the self esteem), social (interaction and perception) factors and traumatizing and uncomfortable experiences affect an individual's well-being.

The report between these factors and the pathology of the dental-maxillary appa-

ratus leads to the evaluation of the quality of life in report to oral health.

In the purpose of evaluating this relation, there are now internationally recognized and adopted methods which materialize in social-dental indicators, designed for use on extensive social groups [14].

These indicators are defined as "evaluations of the level to which oral status may perturb the performance of social functions and lead to major modifications of behavior such as work incapacity, school absence, parenting and home [12].

These indicators are considered essential complementary indicators to clinical analysis and measurable in relation to specific evaluation indicators of oral health [14].

Based on numerous and specific questions, organized into questionnaires, socio-dental indices measure the relation between the quality of life and oral health.

This approach attempts to describe specific experiences and to summarize the entire definition of the relation between the quality of life and oral health.

The First International Conference on Measuring Oral Health and Quality of Life took place in 1997, at North Carolina University (U.S.A.). Ten questionnaires were presented and validated as indicators for the measurement of the relationship between quality of life and oral health.

Most of these questionnaires (Sociodental Scale, RAND Dental Health Index, General Oral Health Assessment Index, Dental Impact Profile, Oral Health Impact Profile, Oral Health Quality of Life Inventory, Oral Impacts on Daily Performances, Geriatric Oral Health Assessment Index, a.s.o.) were created and used on middle aged and third age population [4,5].

Evaluating the impact of oral health on the quality of life of children requires specific determination methods because they differ from adult patients by at least two main characteristics [12,13]. The first, and most important one, is the lack of decision taking capabilty when it comes to maintaining one's own oral health, this decision capabilty belonging to either parents or caregivers. The second main distinction between the adult patient and child patient is represented by the very significant differrences in quality when it comes to perception and experience. Because of these two factors, the evaluation of a child's quality of life in report to his/her dental health calls for means that are specifically adapted to the various phases of development [3,15].

From the various socio-dental indices, used for determining the relation between the quality of life and oral health, the OHIP (Oral Health Impact Profile) and OIDP (Oral Impact on Daily Performances) are some of those adapted for use on children.

The Child-OIDP (the Child Oral Impacts on Daily Performance Index) is used for planning community supported oral health programs for children [7,8].

This indicator uses two steps:

- the first consists in determining self perceived oral health issues by the assisted filling of a list of questions containing most of the oral pathological conditions which are present during childhood.

- step two consists in evaluating the impact of oral conditions on the quality of life of children through the assisted filling (single interview) of the Child-OIDP indicator questionnaire that focuses on eight fields/performances: chewing, speech, oral hygiene, relaxation (including sleep), smiling, emotional state, study (including class attendance and home study), contact with other people. Answering is assisted by images representing either the negative or the positive side of each performance.

The answers to the questionnaire focus both on the frequency and the severity of the oral health issues affecting the quality of the subjects' lives, as well as on the perceived intrusion, the reason which, from the sub-

ject's point of view, caused a certain impact.

The aim of this study is to determine the relation between the quality of life in 12-years old children from Harsova, based on the Child-OIDP index, and the real oral-health status of the subjects.

Materials and Method

The study was realized in the town of Harsova, between March and June 2004, on twelve-year-old subjects. The total number of students of this age at the time was 143.

The subjects and their legal guardians (parents or caregivers) were informed about their participation in this study during classes.

The study includes an examination of the oral health state (at the dental office), filling in a questionnaire and an assisted interview, with one interviewer.

The subjects were organized into weekly groups. They made two appointments each – one for the dental exam and for filling in the initial questionnaire and the second for the interview based on the original Child-OIDP (Child-Oral Impact on Daily Performances) questionnaire introduced by Georgios Tsakos, professor with the Department of Epidemiology and Public Health, University College in London, England.

The evaluation of the real status of the subjects' oral health, based on the clinical oral health indicators, included:

- recording of the dental status, expressed by the DMFT index; the examination was realized exclusively by clinical means, respecting the WHO protocol and criteria (one single examiner, in natural light, after drying and isolating the teeth, using the dental probe and the flat mirror); because of this, the DMFT index does not include the initial enamel lesions;
- OHI-S Green oral hygiene index;
- registration of dento-maxillary anomalies in accordance with the Angle classification;
- measurement of dental fluorosis with the Dean indicator.

The evaluation of the relation between the quality of life and the oral health by the Child-OIDP index (Child-Oral Impact on Daily Performances), following the Georgios Tsakos protocol.

First Step – First list of questions

- filling the first questionnaire (*Figure 1*). This happened both individually and assisted (G. Tsakos recommends groups/classes).

Figure 1. First set of questions

Last Name…… First Name……..
Class……School no……...
Have you, during the past 3 months, had any problems concerning:
(check with an X if you did or still do)

- ❑ tooth ache;
- ❑ dental sensitivity (teeth that hurt when in contact with cold or sweet);
- ❑ dental caries (holes or cavities created by caries into teeth);
- ❑ fractured tooth (broken, chipped);
- ❑ modified (unpleasant) color of teeth;
- ❑ shape or number of teeth;
- ❑ position of teeth;
- ❑ gums bleeding;
- ❑ swollen gums;
- ❑ plaque;
- ❑ bad breath;
- ❑ painful ulcerations inside the mouth;
- ❑ moving deciduous teeth;
- ❑ growing (erupting) permanent teeth;
- ❑ empty slots on the jaw (where permanent teeth are expected to appear);
- ❑ mouth or face deformities (split palate or lip);
- ❑ extracted permanent tooth.

The goal of this first set of questions is to get the subjects accustomed to oral conditions which may represent reasons for impacts, with repercussions on their quality of life.

II nd Step – the Interview

The following interview ignores the answers given to the first set of questions.

It focuses on evaluating the impact of oral disease on the following eight activities:

1. Eating;
2. Speech;
3. Oral Hygiene;
4. Sleep and resting;
5. Smiling, the ability to show one's teeth without embarrassment;
6. Maintaining the emotional status;
7. Study, lessons, learning, going to school;
8. Socializing.

The reminding time for the Child-OIDP index is 3 months.

The questionnaire was filled with an assistant (as indicated in the original questionnaire by G. Tsakos [7,8]), each question coming with supportive explanations, in order to clarify both the content as well as the way to answer about frequency, severity and intrusion perceived of a specific issue.

The frequency and the severity of the impact of oral health issues of the subjects on daily activities were estimated by summing the answers to the questions with the scores for frequency and severity.

To evaluate the perceived intrusion, as the cause which, in the subject's view, determined a specific result, each one of the questions is accompanied by a symptom from the Ist Step list.

The score for the impact of oral health issues on each of the activities is obtained by multiplying the frequency and severity scores.

The final score for one activity (impact intensity) may, in this way, have values ranging from 0 to 9

The impact intensity is calculated as follows:

- **very severe:** value 9 (severity 3 x frequency 3)
- **severe:** value 6 (either severity 3 x frequency 2 or severity 2 x frequency 3)
- **moderate:** values 3-4 (severity 2 x frequency 2; severity 3 x frequency 1; severity 1 x frequency 3)
- **small:** value 2 (severity 2 x frequency 1; severity 1 x frequency 2)
- **very small:** value 1 (severity 1 X frequency 1)
- **zero:** (severity 0 x frequency 0)

The general average (the prevalence) of the impacts of oral health issues on daily activities of the subjects is calculated as a percentage of the maximum obtainable score (9 x 8 = 72), so the sum of the eight activities (which may be anywhere between 0 and 72) is divided by 72 and multiplied by 100.

Another way to appreciate the impact of oral health on the quality of the life of subjects is to verify the number of activities affected by oral health issues.

Results

The present study includes calculations of:

1. oral health clinical indicators;
2. the frequency of oral pathological conditions (specified in the first set of questions) which have been perceived as causing impacts on the daily activities of the subjects;
3. main oral conditions that cause impacts on each of the eight activities (perceived intrusion);
4. the intensity of the impacts of oral health issues on the daily activities of the subjects;

Figure 2. Child-OIDP Registration Form

DAILY PERFORMANCES	SEVERITY	FREQUENCY	PERCEIVED INTRUSION
1. Are you having difficulties eating (biting, chewing)? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
2. Are you having difficulties with speech or word pronunciation? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
3. Are you having problems washing your mouth due to mouth related issues? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
4. Have you had sleepless nights due to toothaches of other mouth related issues? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
5. Did you feel ill because of problems in mouth? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
6. Do you avoid smiling or showing your teeth because of problems inside your mouth? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
7. Have toothaches or other mouth related problems ever prevented you from attending classes or going to school? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?
8. Have your problems with your teeth prevented you from meeting with your friends or from other social activities? How often, during the past 3 months, have you encountered these difficulties?	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	None at all - 0 Very little - 1 Pretty much - 2 Quite a lot - 3	What do you think is causing these difficulties?

5. the general score and the prevalence for the impacts of the oral health issues on the eight daily activities included in the Child-OIDP indicator.

It is important to specify that, out of the initial number of 143 children, 117 have chosen to participate in this study (which accounts for a 81.41% response rate), and out of the latter 60 are female and 57 male.

1. Estimating the Oral Health State on the Basis of Clinical Indicators

1. the average value of the DMFT indicator for the 117 subjects is 2.59;

2. 22.22% (26 children) do not have

caries on the permanent teeth;

3. the average value of the oral hygiene indicator OHI-S is 2.8 (values range from 0.5 to 3);

4. 58.97% of the subjects (69) show dental-maxillary anomalies (Ist, IInd and IIIrd Angle class);

5. 17.94% of the subjects (21) show white spots consistent with uncertain and incipient fluorosis.

2. The Frequency of Pathological States Specified in the First Set of Questions and Which of Them Were Perceived as Having Impact on the Daily Activities of the Subjects:

The frequency of the oral health issues which were perceived by the subjects and mentioned in the answers to the first set of questions are shown in *Table 1*.

Self perceived oral issues which have a major negative impact on the daily activities of the children are:

- bleeding gums – 62.39%
- dental sensitivity – 44.44%
- toothaches – 38.46%
- badly positioned teeth – 28.20%

Among those less mentioned we count:

- bad breath and oral ulcers – 5.12%
- erupting permanent teeth – 3.41%
- tooth shape and number – 2.56%

Fractures to permanent teeth, mouth and face deformities or missing permanent teeth were not mentioned.

Table 1. The frequency of oral conditions mentioned in the first set of questions

Oral symptom	Frequency (%)
Toothache	38.46
Dental sensitivity	44.44
Tooth decay	11.11
Permanently fractured tooth	0
Modified teeth color	11.96
Modified teeth shape or number	2.56
Dental position	28.20
Gum bleeding	62.39
Gum swelling	3.41
Plaque	21.36
Bad breath	5.12
Oral ulcers	5.12
Exfoliating deciduous tooth	10.25
Erupting permanent tooth	3.41
Unerupted permanent tooth; slot/space	0.85
Mouth and face deformities	0
Missing permanent tooth	0

3. Main Oral Conditions Which Cause Impacts on Each of the eight Activities (step 2 questionnaire analysis)

Oral conditions which caused impacts on each of the eight activities (perceived intrusion) and the frequency with which certain oral pathological states caused impacts on each of the 8 activities are presented in *Table 2.*

Eating has been mostly affected by toothache and teeth sensitivity and by the exfoliation of deciduous teeth.

Speech suffered because of badly positioned teeth, toothaches and bad breath.

Oral hygiene was impacted by bleeding gums and dental sensitivity.

Sleep and resting were affected by toothaches and gingival ulcers.

Table 2. Perceived Intrusion

PERFORMANCE	# of subjects who reported impacts on each activity	Causes for the Impacts (percentage of subjects who reported a specific cause impacting on a specific action)												
		Sensitivity	Pain	Exfoliation	Position of teeth	Ulceration	Caries	Eruption	Bad breath	Gum bleeding	Gum inflammation	Slot/ space	Color	Shape/ no. teeth
Eating/Drinking	65	35.38%	32.33%	10.76%	7.69%	7.69%	6.15%	4.61%	-	-	-	-	-	-
Speech	18	-	27.77%	-	55.55%	-	-	-	16.66%	-		-	-	-
Oral hygiene	37	32.43%	-	5.4%	-	-	5.4%	5.4%	-	45.94%	5.4%	-	-	-
Sleep/Resting	7	-	57.15%	-	-	42.85%	-	-	-	-	-	-	-	-
Smiling	9	-	-		33.33%	-	4.76%	-	-	-	-	28,57%	23,8%	9,52%
Emotional status	21	-	66.66%	11.11%	-	22.2%	-	-	-	-	-	-	-	-
Study	6	-	66.66%	-	-	33.33%	-	-		-	-	-	-	-
Socializing	7	-	-	-	42.85%	-	-	-	28.57%	-	-	-	-	-

Table 3. The Intensity of the Impacts on Daily Activities and Their Rate

Activity	# of subjects who reported impacts on an activity	Intensity of the impacts										# of subjects who did not report any impact on their activities (out of total #)
		Very Severe		Severe		Moderate		Small		Very Small		
		# of subj. who reported very severe impacts	Percent of those who reported impacts on an activity	# of subj. who reported severe impacts	Percent of those who reported impacts on an activity	# of subj. who reported moderate impacts	Percent of those who reported impacts on an activity	# of subj. who reported small impacts	Percent of those who reported impacts on an activity	# of subj. who reported very small impacts	Percent of those who reported impacts on an activity	
Eating	65	1	1.5%	2	3%	18	27.6%	25	38.4%	19	29.2%	52
Speech	18	-	-	-	-	6	33.3%	4	22.2%	8	44.4%	99
Oral hygiene	37	2	5.4%	6	16.2%	10	27%	11	29.7%	8	21.6%	80
Sleep, Resting	7	-	-	-	-	-	-	1	14.28%	6	85.7%	110
Smiling	21	-	-	-	-	5	4.07%	1	28.5%	15	71.4%	96
Emotional state	9	-	-	-	-	2	22.2%	4	44.4%	3	33.3%	108
Studying	6	-	-	-	-	-	-	2	33.3%	4	66.6%	111
Socializing	7	-	-	-	-	2	28.5%	2	28.5%	3	42.8%	110

Smiling was often affected by badly positioned teeth, empty spaces for erupting permanent teeth and modified tooth coloration. The emotional status suffered because of toothaches, by gingival ulcers and exfoliating deciduous teeth.
Learning (studying) was affected by toothaches and gingival ulcers.

4. The Intensity of Oral Impacts on Daily Activities

The intensity of oral health issues impact on daily activities of the subjects is showed in *Table 3*.

A small number of subjects suffered very severe (3 subjects) and severe (8 subjects) impacts of the oral issues on daily activities, and the most affected activities were feeding and exercising of dental hygiene.

The prevalence of the impacts of oral health on daily activities increases proportionate with the reduction in intensity: 43 subjects suffered from moderate impacts, 50 – small impacts and 67 very small.

At the same time, as the intensity of impacts decreases, the number of affected activities increases. If severe and very severe impacts affect a reduced number of activities (feeding and oral hygiene), moderate impacts refer to 6 (feeding, speech, oral hygiene, smiling, the emotional state and social relations), while the small and very small ones affect all eight.

So, a subject who suffers from numerous impacts, but of reduced intensity, with implications on all daily activities is actually much more affected by oral health issues than another one suffering from very severe impacts, which only affect a reduced number of his actions.

The actions most affected by oral health issues are feeding and oral hygiene, followed by smiling and speech capacity.

The least affected are studying, sleeping and socializing.

5. The General Score of the Child-OIDP Indicator

The general score for the Child-OIDP indicator that was obtained in this study was calculated as an average of the scores obtained for each of the subjects.

The final scores for the subjects included in the study ranged between 0 and 63, and the average is of 46.764 points.

Discussions

Because of the fact that the studies concerning the relation between oral health and the quality of life of children aged 12 are not so numerous even internationally and the analysis criteria and categories vary, comparative studies are quite limited.

In adolescents of Brazil [11], the frequency of impacts of oral health on their quality of life is 32%, and in Uganda 62%.

The frequency of toothache in South Africa schoolchildren is 88% and in those of New Zealand – 73% [6].

The prevalence of oral impacts, measured using the Child-OIDP indicator, for the twelve-year-olds in the present study was 64.95%

Even though this value is not proportionate to the relatively small DMFT index value, it may be correlated with unsatisfying dental hygiene (OHI-S = 2.8) and with the large frequency of dental-maxillary anomalies.

It is important for this study that, even though the impacts of oral health on the quality of the subjects' life are frequent, their intensity is mainly moderate-small.

Very severe and severe impacts occur only in a reduced number of activities: feeding and oral hygiene performance.

From the point of view of the activities most often affected by oral health issues, the present study is in accordance with all other studies of this type performed on subjects of the same age [1,2].

Feeding and oral hygiene performance

are also the daily activities that suffered most frequently because of oral health issues.

The reasons of these impacts are physical agents, toothaches, exfoliating deciduous teeth, badly positioned teeth, oral ulcers and carious cavities, which limit the consumption of certain food-types and which will eventually cause improper feeding from a quality point of view for the twelve-year-olds, involved in full process of growth and development.

Another extremely important activity for each individual's oral health is the performance of oral hygiene. It is badly affected by oral disease and particularly by bleeding gums, as deducted from the present study. The absence of proper oral hygiene, overlapped with already existing issues, will most certainly lead to increasing oral disease in these subjects.

Smiling and social relations are most often affected by misplaced teeth and color changes.

The least affected by oral health issues are studying and socializing.

Conclusions

1. The general score for the Child-OIDP indicator obtained in this study, making the average of each subject's score, is of 64.95%

2. The elevated score for the Child-OIDP obtained in this study is in accordance with the reduced oral health status of the subjects, and especially that of (unsatisfying) dental hygiene and increased frequency of dental-maxillary anomalies.

3. The oral health issues most frequently perceived to have a negative impact on the daily activities of children are bleeding gums (62.39%), dental sensitivity (44.44%), toothaches (38.46%) and misplaced teeth (28.20%)

4. Oral conditions perceived by the subjects to have a small impact on the quality of life are bad breath and oral ulcers (5.12%) erupting permanent teeth (3.41%) and the shape and the modified number of teeth (2.56%)

5. Feeding and oral hygiene, followed by smiling and speech are the most affected activities by oral health issues.

6. The least affected are studying, resting and socializing.

7. The number of subjects that have suffered very severe and severe impacts is small (9.4%), and the respective affected activities are feeding and dental hygiene.

8. The prevalence of the impacts of oral health on daily activities increases proportionate to the decrease in intensity.

9. With the decrease of impact intensity, the number of affected activities increases (severe and very severe impacts affect a reduced number of activities while the lesser ones affect all of the eight activities included in the questionnaire).

10. The present study may constitute one of the pilot studies for validating the Child-OIDP in Romania.

11. Further extensive studies, performed both on the adult and juvenile population will be required to accurately appreciate the way in which the oral health status affects the quality of life for the population of our country.

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