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REVIEW

How to make a link between Oral Health-Related Quality of Life and dentin hypersensitivity in the dental office?

Jean-Louis Sixou

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Abstract
Objectives Oral Health-Related Quality of Life (OHRQoL) can be considered as the scientific expression of that part of a person's well-being that is affected by his/her oral health. The aim of this paper was to evaluate how to use the data available in the field of research to make a link between OHRQoL and dentin hypersensitivity (DHS) in the dental office.
Materials and methods Research papers in the field of OHRQoL and DHS and reviews and research papers about OHRQoL were used for analysis in this short review, with a particular insight on the instruments used to evaluate OHRQoL.
Results Various psychometric instruments have been used to measure OHRQoL that are more or less patient- or expert-centred. Some are generic, others are adapted to specific conditions/domains or populations. The impact of DHS or exposed cervical dentin (ECD) on OHRQoL has been assessed in very few studies. It is therefore of the upmost importance that the use of the OHRQoL as a quality control tool be established in robust clinical studies.
Conclusions/clinical relevance Future studies evaluating the impact of the DHS/ECD on OHQoL or evaluating the efficacy of desensitising agents should respect some key points, including study design (randomization, placebo/control group, etc.), validated specific questionnaires and trained calibrated practitioners.

J.-L. Sixou (✉)
Department of Paediatric Dentistry, Faculty of Odontology,
University of Rennes 1, 2, Avenue du Professeur Léon Bernard,
35 043 Rennes Cedex, France
e-mail: jean-louis.sixou@univ-rennes1.fr

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Currently, there appears to be no consensus to define Health-Related Quality of Life (HRQoL). HRQoL is dynamic, fluctuating and is related to the physical, mental and social (functional and psychosocial) aspects of an individual's well-being. Although there are generally satisfactory ways of defining and measuring the frequency and severity of diseases, this may not be the case in so far as the measurement of well-being and quality of life is concerned. Similar problems have to be confronted when trying to define Oral Health-Related Quality of Life (OHRQoL) issues. OHRQoL can be considered as the scientific expression of that part of a person's well-being that is affected by his/her oral health. Therefore, OHRQoL may provide a new perspective when looking at a patient, by measuring treatment efficacy in terms of patient satisfaction, in addition to the more traditional objective data measured in patients' mouths such as remineralisation of teeth or bleeding indices. The assessment of OHRQoL may therefore help define the assessment needs to dentists, patients and commissioners/planners of health-care provision.

Why is it difficult to evaluate OHRQoL?

OHRQoL deals with conditions that vary in intensity and importance. These conditions may be life-threatening (e.g. oral cancers) or not, progressing (caries, periodontitis, etc.) or not, dealing with aesthetics (staining in anterior teeth such as molar–incisor hypomineralisation (MIH)) or pain

(pulpitis, MIH in posterior teeth, etc.). OHRQoL is highly subjective and has to be assessed within the framework of patients' conditions, sociocultural environments and own experiences and states of mind: because OHRQoL is related to daily life and is unique to each individual, even patients with severe conditions can report having good quality of life. Furthermore, Quality of Life is by itself multi-faceted, showing variation over time for each individual. OHRQoL should therefore be assessed longitudinally to take into account changes over time, using versatile tools.

How to assess OHRQoL?

The main difficulty is to reflect patients' concerns. This means having relevant questions with well-defined items and being able to analyse answers in a good way. Many limitations can be found to the current validation testing, including relevance of the questions, validity and sensitivity to change, risk of misinterpretations (role of the ethnocultural environment), problems of translation of English questionnaires and difficulty to interpret the significance of a psychometric measurement when reported simply as a numerical score or a mean [1, 2]. This latter point is of importance since the same score can be obtained from people answering in a different way to a majority of questions. Finally, patient-based outcome measures (as named by Fitzpatrick et al. [3]) should provide the opportunity to measure the extent or intensity of the changes in OHRQoL.

Various psychometric instruments have also been used to measure OHRQoL (Tables 1 and 2) [1, 4]. These are based on different criteria that enable them to be more or less patient- or expert-centred. Some are generic (OHIP[1]-49, OHIP-14, OIDP, OH-QoL, SF-36[2]) and can be considered as core indicators; others are adapted to specific conditions/domains (Orthognathic QOL Questionnaire, SOOQ for orthodontic surgery, OHIP-aesthetic,[3] OHRQOL for Dental Hygiene) or populations (COHQoL and Child-OIDP for children, GOHAI for elderly people, etc.).

The OHIP, also called OHIP-49, is the most widely used, and this has enabled investigators to modify forms that can be subsequently adapted to populations or conditions. The initial 49-question form was constructed to assess the 'social impact' of oral disorders [5]. Each of the set of 49 statements represented one of seven domains: It is mainly expert-centred and constructed to select items according to their fit with a conceptual framework rather than on the basis of their importance to the patients from whom they were derived [4]. A shorter version of OHIP restricted to 14 items (OHIP-14) was later proposed [6]. One major question is to know if we need to use either a generic questionnaire, an adapted form of a generic questionnaire or to construct a new questionnaire specific to the population or condition to be studied. Constructing or using one of these specific questionnaires may lead to many questions, for example, (1) Is it made specifically for the purpose of research or for clinical practice? or (2) How to adapt each questionnaire to local languages and cultures? This may subsequently lead us to consider the impact of dentin hypersensitivity (DHS) or exposed cervical dentin (ECD) on OHRQoL of those individuals being assessed.

DHS/ECD and OHRQoL: what is known and where are the problems?

Very few studies have been devoted to this aspect of DHS/ECD as recently shown [7], with only two papers written in English specifically dedicated to the evaluation of OHQoL in DHS/ECD patients. One paper provided results using a generic questionnaire [8] and the second paper constructed a specific questionnaire to evaluate OHQoL in DHS/ECD patients but provided no epidemiological results [9]. These studies are more extensively described in an accompanying paper [7]. In the future, studies using validated questionnaires specifically constructed to evaluate the impact of the condition on OHQoL should be employed. These questionnaires should be patient-centred and derived from interviews with patients who are expected to complete the questionnaire [4, 10]. Furthermore, if these studies also attempt to evaluate the efficacy of desensitising agents in reducing DHS/ECD and its subsequent impact on OHQoL, then it is imperative that the condition should be clearly diagnosed by trained and calibrated dentists experienced in conducting clinical studies using recognised and accepted clinical criteria for the evaluation of DHS/ECD. Due to the cultural and language differences between countries, there is also a need of norm or reference value(s) for each population to be studied. For example, when constructing a questionnaire for a non-English-speaking population, the questionnaire should be initially written in English, then translated by two people of the designated native (foreign) language and subsequently translated back into English by two native English-

[1] See Tables 1–2 for the meaning of initials.
[2] SF-36 stands for Short Form (36) Health Survey, which is a survey of patient health.
[3] OHIP-aesthetic is the short form of OHIP for dental aesthetic.

Table 1 Conceptual and structural basis of psychometric instruments used in dentistry (adapted from Brondani and McEntee [1])

Instruments	Acronym	Structural origins	Empirically based[a]	Connotation of questions	Number of questions[b]
Social Impacts of Dental Disease	SIDD	SIP	Yes	N	14
Oral Health Impact Profile	OHIP	ICIDH	Yes	N	49
Geriatric (Generic) Oral Health Assessment Index	GOHAI	ICIDH and SIP	Yes	N and P	12
Oral Health-Related QoL-Instrument	OHRQL	Multiple[c]	No	N	36
Oral Impact on Daily Performances	OIDP	ICIDH	No	N	8
Dental Impact on Daily Living	DIDL	SIP	Yes	N and Nt and P	36
Dental Impact Profile	DIP	SIP	Yes	N and Nt and P	25
Oral Health-Related Quality of Life measure	OHQoL	Multiple[d]	No	N	3
Oral Health Quality of Life Inventory	OH-Qol	SIP	Unclear	P	15
Rand Dental Questionnaire	Unspecified	SIP	No	N	3
Oral Health Questionnaire	Unspecified	ICIDH	Unclear	N and Nt and P	70
Oral Health Quality of life UK	OHQoL-UK	ICIDH2	Yes	N and P	16
Subjective Oral Health Status Indicators	SOHSI	Multiple	No	N and Nt	34
Liverpool Oral Rehabilitation Questionnaire	LORQ	Unclear	No	N	40
Self-rated Oral health	SROH	ICIDH	No	N and P	3
DENTAL	DENTAL	Unclear	No	N	15
Dental Health Status Quality of Life Questionnaire	DS-QoL	Generic QoL Instrument	No	N and P	Unclear

N 1/4 negative, *Nt* neutral, *P* positive, *SIP* Sickness Impact Profile, *ICIDH* International Classification of Impairments, Disabilities and Handicaps

[a] Information derived from open-ended interviews

[b] Some indicators present shorter or extended forms other than the original version

[c] Health-related models: Natural History of Disease Model and SIP

[d] Developed from existing measures (RAND, oral facial pain index, etc.).

speaking people to identify any potential issues that may have arisen from the translation. Finally, as indicated above, any future study attempting to evaluate the efficacy of a desensitising agent in reducing DHS/ECD and its subsequent impact on OHQoL should be conducted by experienced and calibrated examiners using established guidelines for conducting DHS/ECD clinical studies. Such studies should also be based on a randomised clinical study design and include both placebo or control groups.

Table 2 Oral health outcome measures developed before 2007 (adapted from Locker and Allen [4])

Pre-1997 (presented at the 1997 conference [11])
Social Impacts of Dental Disease
General (Geriatric) Oral Health Assessment Index (GOHAI)
Dental Impact Profile (DIP)
Oral Health Impact Profile (OHIP)
Oral Impacts on Daily Performances (OIDP)
Subjective Oral Health Status Indicators (SOHSI)
Oral Health-Related Quality of Life Measure
Dental Impact on Daily Living (DIDLS)
Oral Health Quality of Life Inventory
Rand Dental Questions
Post-1997
OHQoL-UK
Child Oral Health Quality of Life Questionnaire (COHQoL)
Child OIDP
OHRQOL for Dental Hygiene
Orthognathic QOL Questionnaire
Surgical Orthodontic Outcome Questionnaire (SOOQ)

What are the recommendations for daily dental practice?

Patients suffering from DHS/ECD have been reported to have a significantly impaired OHRQoL; this may however be improved following treatment with a desensitising agent as reported by several authors. It is therefore of the upmost importance that the use of the OHRQoL as a quality control tool in the dental office be established in robust clinical studies. Furthermore, because of its ability to reflect a patient's satisfaction with any proposed treatment, it may prove to be a valuable asset for practitioners when assessing their patients' quality of life before, during and after treatment of various clinical conditions such as DHS/ECD.

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Conflict of interest The author declares that he has no conflict of interest.

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