TEACHERS' PERCEPTION OF ORAL HEALTH STATUS. DESIGN AND VALIDATION OF AN EVALUATION INSTRUMENT

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ABSTRACT

The evaluation of health status is a complex process that requires the use of indicators that assess health both in terms of disease and of the impact the health-disease- care process has on the quality of life. The aim of the present study was to design and validate an instrument to evaluate teachers' perceptions of oral health status. The sample comprised 78 teachers of 4 schools (province of Buenos Aires). ***Design of the instrument****: (a) identification of the 5 categories that compose the instrument and can measure the object of study based on evidence; (b) creation of a questionnaire that contains 32 items by two researchers; (c) evaluation of the questionnaire by 5 professionals of 4 different professions to standardize criteria (Ventegodt et al, 2003) applying an ordinal scale. Items were reduced to 25 (Index of perception of oral health: IPOH).* ***Validation of the instrument:*** *the following parameters were evaluated: reliability employing the test-retest method at 30 days; internal consistency employing Cronbach's α coefficient (1951); content validity determined by two experts; construct validity employing the method of extreme groups (Student's t test). The established categories were knowledge on oral health, personal experience with oral health care, expectations regarding their students' families, expectations regarding dentistry, satisfaction with his/her role as a teacher. The instrument proved to be reliable as evidenced by a value of r=0.80 in the test-retest method; a satisfactory intra-items consistency was evidenced by Cronbach's α coefficient value of 0.82. The differences between the results of the groups of teachers in the extreme groups were statistically significant (p=2.2). The instrument designed to measure the teachers' perception of oral health status would be valid. It would be desirable to enlarge the sample and determine criterion validity by comparison with other instruments.*

Key Words: *Perception of health. School programs. Quality of life.*

PERCEPCIÓN DE LOS DOCENTES RESPECTO DEL ESTADO DE SALUD BUCAL. DISEÑO Y VALIDACIÓN DE UN INSTRUMENTO EVALUATIVO

RESUMEN

El proceso de medición de la salud es un proceso complejo que requiere del uso de indicadores que la evalúen no solamente desde los parámetros que miden la enfermedad sino desde los que evidencian el impacto que el proceso de salud-enfermedad-atención es capaz de causar sobre la calidad de vida. El objetivo de la investigación fue construir y validar un instrumento que permita establecer las percepciones de los maestros referidas a salud bucal. La muestra estuvo constituida por 78 docentes de 4 escuelas (Pcia de Buenos Aires). ***Diseño del instrumento****: (a) identificación de las cinco categorías que integran el instrumento y que podrían medir el objeto en estudio de acuerdo con la evidencia; (b) elaboración de la encuesta de 32 items por parte de dos investigadores; (c) valoración de la encuesta por parte de 5 profesionales de 4 profesiones diferentes para analizar el ajuste de los criterios (Ventegodt et al, 2003) aplicando una escala ordinal, reduciéndose a 25 items (Indice de percepción de salud bucal: IPSB)* ***Validación del instrumento:*** *Se realizó la evaluación de las siguientes condiciones: confiabilidad mediante la aplicación de test y retest a los 30 días; consistencia interna, mediante el coeficiente α de Cronbach (1951); la validez de contenido, se determino por opinión de expertos; la validez de construcción fue evaluada mediante el método de grupos extremos (t Student).*

Las categorías establecidas fueron: conocimientos sobre salud bucal; experiencia personal con la atención odontológica; expectativas sobre las familias; expectativas sobre la odontología; satisfacción con su papel docente. El instrumento resultó confiable ya que en el test-retest se obtuvo una correlación de r=0,80; el coeficiente α de Cronbach fue de 0,82, demostrando una coherencia intraitems satisfactoria. Las diferencias correspondientes a los resultados de los grupo de docentes ubicados en los extremos resultaron estadísticamente significativas.(p= 2,2).

El instrumento elaborado para medir la percepción de los docentes respecto de la salud bucal parece resultar válido, siendo recomendable ampliar la muestra de aplicación y determinar la validez de criterios mediante la contrastación con otros instrumentos.

Palabras Clave: *Percepción de salud. Programas escolares. Calidad de vida.*

INTRODUCTION

Measuring health status is a complex process that requires the use of indicators that evaluate health both in terms of disease and of the impact the health-disease- care process has on the quality of life. The evaluation of quality of life is not a new concept. Karnofsky and Burchenal introduced this concept in studies on chemotherapy for the treatment of cancer (27). The WHO defined health related quality of life as "the perception by individuals of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. This wide-ranging concept is affected by people's social relationships, physical health, psychological state and level of independence."

The perception of health status by the individual is a more significant indicator than clinical indicators. Researchers use this indicator to understand the value the individual assigns to health. The modern concept that assigns the role of co-therapist to the patient, included in all the modern codes of ethics, derives from the need to objectively interpret the perception of the patient of his/her quality of life at a given moment during the health-disease-care process. This knowledge may contribute to the analysis of the evolution of the disease or of the efficacy of treatment (1-3, 4, 5, 14, 22, 41).

We face two methodological problems when attempting to evaluate quality of life: (a) the measurements involved are considered "soft", and (b) there is no control or "gold standard" to compare against. The variable degree of subjectivity involved requires the use of valid, reproducible and reliable methods of evaluation.

Ventegodt et al. (45) analyzed, epistemologically, the process that goes from the abstract conception of philosophy of life to the questionnaires used today and the requirements involved. These instruments are aids to the clinician for the integral evaluation of the patient and the execution of clinical trials.

These questionnaires are structured in clearly delimited domains, based on cultural and subjective features, considered relevant within the current historical and social context. The questions to be included in each domain can be interpreted subjectively. However, if they are formulated concisely, they admit a single, logical answer and avoid equivocal answers, despite the evident loss in semantic richness (46).

The organization in domains resembles that of other scientific fields that requires simplification for its operational process. The use of these questionnaires involves **recognizing** the domains or fields, **selecting** those related with the issue to be addressed and **adjusting** the codes to make them understandable to the respondents. If the domains and the questions selected are adequate, the result on the measuring scale will differ from the actual value of quality of life by a small measurement error but will be liable to statistical analysis.

The use of these studies and their methodological analysis began with adults. The scarcity of measurements in children is partly due to the methodological and conceptual difficulties involved in the creation of questionnaires *ad hoc.* However, it has been established that as from age 6, the responses of children can be contrasted against those of other children and against established norms. Likewise, specific questionnaires have been created and validated for early adolescence (15, 16, 17, 20, 31). However, because child health care and preventive school programs are widely present in the media, it is contributory to be aware of the perception of fathers/mothers and parental figures of health related quality of life (27).

The application of different questionnaires, validated for different scenarios, requires a process of adjustment that will guarantee its relevance within the psycho-socio-cultural context that characterizes each community (27, 28, 44).

A measurement is considered validated when its reliability and validity have been demonstrated.

The **reliability** of an instrument refers to the reproducibility with which it measures the end-point under study. Reliability can be established by evaluating stability and internal congruence or degree of homogeneity. Stability measures the degree to which an instrument yields consistent results when applied repeatedly and there is no evidence of change (6, 35). An instrument is said to have internal congruence when its constituting subparts measure the same attributes.

Validity refers to the extent to which the instrument adequately reflects the true meaning of the concept under consideration (30, 38). Validity is established in terms of criterion-related validity, content validity and construct validity. Criterion-related validity refers to the relation between the instrument and the criterion employed. It may be predictive or concurrent. Construct validity is based on the logical

relationships among variables. Content validity refers to how much a measure covers the range of meanings included within the concept.
The aim of the present study was to design and validate an instrument to establish teachers' perceptions of oral health to be applied within the context of school projects in urban areas.

MATERIAL AND METHODS

Design of the instrument

The index of perception of oral health (IPOH) was constructed in keeping with the process described by Guyatt *et* al. in 1993 (12), Juniper *et* al. in 1996 (22) and applied by Jokovic *et* al. in 2002 (15).

Design included the following phases:

1. Identification of the five domains that could evaluate the study object based on scientific evidence. The established categories were identified as fields associated to the data structure required for decision making for future actions. The following categories were identified:
   - *Knowledge of oral health and its limitations;*
   - *Personal experience with dental care;*
   - *General expectations regarding the families of their group of pupils;*
   - *Expectations regarding dentistry;*
   - *Satisfaction with the different aspects of their role as teachers.*

2. Within the context of these categories, 2 researchers prepared 32 questions based on the evidence derived from the revision of the indices of oral health status of children and related adults.

3. The questions were evaluated in terms of clarity, relevance and comprehensibility by 5 experts, i.e. 5 professionals of 4 different professions related to child-care (one psychologist, one physician, two dentists and one educational scientist) in keeping with the following criteria:
   - *Reasonable and comprehensible*
   - *Sensitive to variations*
   - *Based on justifiable and instinctively reasonable assumptions*
   - *With clearly defined components*
   - *Derived from data that are feasible to obtain*

4. With the purpose of adjusting the items and based on the answers, 7 items were excluded. A questionnaire of 25 items was agreed upon. (Index of perception of oral health: IPOH). The experts' criteria were applied to explore the possibility of reducing the dimensionality of the questionnaire, achieving a structure with strong correlation between fields. If it were not possible to reduce the dimensionality of the questionnaire, we could assume the existence of 5 relatively distinct and independent fields (12).

5. A combined 5 point scale was established for each question, in keeping with the criteria of Ventegodt (46) who combines 3 types of scales (Likert's scale, the visual analogous scale and the numeric scale) in a single, reduced, valid and highly sensitive model. This scale can be applied as a numeric, ordinal or percentage scale (29).

Validation of the instrument

The validation sample was composed of 78 volunteers, all teachers of 4 public schools of a district of the province of Buenos Aires. The questionnaire was prepared for self-administration and was given simultaneously to all the teachers in all the schools to guarantee independent responses. Re-testing was performed 30-35 days later by distributing the same questionnaire with no intervening recommendations.
Reliability was evaluated by the test-retest method. The statistical significance between both sets of records was analyzed by Student's t test. Internal congruence was determined by Cronbach's α coefficient (35). Content validity was established by the experts. Construct validity was evaluated by the extreme groups method and Student's t test to analyze the variation coefficient of each of the fields. The confidence limits of each question were analyzed, considering the categories as ordinal.

RESULTS

All the results were recorded. The means for each item and domain or field were calculated. Table I shows the results of the first application of the questionnaire.

Analysis of the reliability of the questionnaire

Table II shows the results of the stability test employing the test-retest method. No statistically significant differences were observed, revealing that the instrument was stable.

TABLE I: Results of the application of the questionnaire for each domain	
DOMAIN	**MEAN SE**
Knowledge of oral health and its limitations	4.25 ± 0.04
Personal experience with dental care	2.10 ± 0.50
General expectations regarding the families of their group of pupils	2.21 ± 0.66
Expectations regarding dentistry	2.11 ± 0.88
Satisfaction with the different aspects of their role as teachers	2.68 ± 0.75
Total mean of the questionnaire	**2.61 ± 0.73**

TABLE II: Analysis of the stability of the questionnaire		
DOMAIN	**TEST**	**RETEST**
Knowledge of oral health and its limitations	4.25 0.04	4.27 0.06
Personal experience with dental care	2.10 0.50	2.12 0.6
General expectations regarding the families of their group of pupils	2.21 0.66	2.36 0.70
Expectations regarding dentistry	2.11 0.88	2.17 0.9
Satisfaction with the different aspects of their role as teachers	2.68 0.75	2.53 0.75
Total questionnaire	**2.67 0.73**	**2.69 0.77**

All the domains were relatively independent, with exception of "expectations regarding dentistry" and "personal experience with dental care" where a trend towards dependence/correlation between domains was observed.

Analysis of the internal consistency of the instrument

Regarding the metric properties of the study, we calculated Cronbach's α coefficient to determine the global consistency of the instrument (Table III). Cronbach's α coefficient was 0.8188, demonstrating a satisfactory intra-item congruence.

TABLE III: Analysis of the internal congruence of ipoh index
CRONBACH'S COEFFICIENT OF CONGRUENCE
= N- r / 1 (N-1)- r
= 0.8188

Analysis of the test of the extremes

When the means were disregarded and the data for the extreme groups for each item and each domain were compared, statistically significant differences were observed. These differences were found both when each of the items was considered with its confidence limits and when only the **extreme scores** were considered and the 3 **middle scores** were disregarded. In the case of the domains the differences were revealed by Student's t test, disregarding only the middle score (Table IV).

DISCUSSION

Quality of life has been considered a vague and ethereal concept. However, the importance of the subjective perception of the patients of their own health status, measured with instruments (question-

TABLE IV: Analysis of construct validity by the technique of extreme groups applied to each of the domains				
DOMAIN	**SMALLER VALUES**	**LARGER VALUES**	**t**	**p**
Knowledge of oral health and its limitations	**1.99 0.22**	**7.79 1.86**	**3.097**	**0.002**
Personal experience with dental care	**1.54 0.09**	**6.2 1.60**	**2.908**	**0.004**
General expectations regarding the families of their group of pupils	**1.86 0.66**	**8.47 0.70**	**2.378**	**0.019**
Expectations regarding dentistry	**1.685 0.53**	**8.33 1.66**	**3.816**	**0.000**
Satisfaction with the different aspects of their role as teachers	**2.21 0.53**	**8.14 2.33**	**2.482**	**0.014**

naires) that require validation prior to use, has been increasingly recognized. Clinical researchers began, gradually but uninterruptedly, including this type of study in clinical trials and in the follow-up of pathological lesions. Very importantly, efforts were devoted to the reliable, objective analysis of the quantitative evaluation of validated questionnaires (15, 18).

Let us consider separately the analysis of the instrument and the results obtained when it was applied.

Analysis of the instrument

Compared to other questionnaires, it fulfils 2 basic requirements:

1. The questionnaires are prepared for self-administration
2. The use of different scales and items makes the questionnaire easy to apply.

Furthermore, the instrument exhibited the following necessary attributes:

- Broad, including a considerable proportion of the aspects involved in the issue under study.
- Sure, i. e. can define concepts unequivocally, is reliable and has internal consistency in such a way that contradictory answers are avoided or can be identified.
- Sensitive, capable of identifying even small variations in the teachers' perceptions and thus capable of evidencing variations after an educational experience.

The results reveal that the instrument is reliable. We must emphasize that perception questionnaires such as those that evaluate quality of life do not replace analytical, or morphological evaluations. Instead, they are complementary in that they introduce the vision of the actor, patient or responsible individual regarding his/her perception of health status. Thus, the measurement is the complex result of the individual's perceptions, probably originating in his/her life experience and historical-social context, and brings together expectations, needs and desires in the lives of the respondents. In addition, it contributes to the understanding of the problem under study and favors the choice of a better approach in decision-making at the level of clinical or sanitary intervention.

Two types of instruments can be used to analyze perceptions or other aspects related to quality of life, i. e. generic and specific questionnaires. Generic questionnaires allow for the comparison of different situations or pathological processes. The scales employed are pooled to yield an overall score. In that sense they are inadequate to identify the changes elicited by a specific intervention, whether educational or therapeutic. Specific questionnaires allow for quantitative evaluation of the changes introduced by a specific therapeutic intervention both in healthy adults and in medically compromised patients (7-11, 13, 32-34, 36, 37, 40, 42, 43).

The indices currently in use in dentistry to collect data on the oral health of the population are still the clinical indices both for caries and periodontal disease and only measure the presence and severity of the disease. However, these indices do not afford information on the functionality of the oral cavity, the individual as a whole or the individual's perception of subjective symptoms (24-26).

A predominantly clinically oriented dental practice originated in several causes, among which we can list the following:

- The clinical course of most oral diseases, which are not life threatening.
- The marked influence of the intervention of the patient and the professional on the course of oral diseases and treatment outcome.
- The lack of integration between clinical dentistry and other areas of knowledge and the scarce interest in communitie's health, in particular in research projects related to oral health care.
- The perceptions and concepts of the researchers themselves who fail to admit or simply ignore the influence of oral health on the individual's life.

These concepts and viewpoints of the dentists have changed as a result of recent studies that have demonstrated the significant load oral diseases imply for the individual and society as a whole.

Analysis of the data derived from the application of the questionnaire

Health opportunities are related to quality of life given that oral health issues and the way they are perceived can affect behavior within social and work environments and even influence treatment compliance. Atchinson (5) reported that few studies have addressed the association between clinical aspects of oral health, quality of life and health

opportunities. For example, HIV patients often fail to seek treatment for their oral diseases for fear of discrimination by the professionals (39). Likewise, several studies have demonstrated the impact of opportunity on quality of life, given that the perception of the health-disease-care process can condition the way in which patients care for their health and their resilience expressed in terms of their ability to endure stress and recover health.

The application of this questionnaire arises as a need to identify the perceptions of the teachers involved in health promotion activities. These perceptions can act as a variable that influences activities related to their own health and that of their pupils.

In previous studies we showed that teachers' perceptions reflect their preconceptions related to family, especially in the case of low income families (39). These findings revealed the need to explore these perceptions and act on them before recruiting teachers for promotion and prevention programs. The application of this validated questionnaire in our sample confirmed these observations and would contribute to the knowledge of health planners of the social and emotional aspects involved and of the needs of other participants in health management. This would favor the provision of adequate care, centered on the resolution of these needs.

Jokovic et al. (20, 21) analyzed the degree of congruence between the perceptions of mothers and children regarding health related quality of life. The same authors (19) reported that parents are relatively unaware of their children's perceptions of their own health and stress the importance of understanding these aspects when a pediatric treatment must be designed and implemented. Squassi et al. (39) showed the existence of negative congruences and divergences between parents and dentists regarding the oral health of the children they are responsible for. This characteristic would act as a conditioning variable in oral health care and, consequently in oral health status. The same study reported on the differences between the data originated in mothers and fathers. Locker et al. (30) informed that the orofacial features of the children have an impact on the family and developed a Family Impact Scale to evaluate this phenomenon.

Likewise, the indicators that were incorporated to the perception questionnaires have multiple applications, including cost-utility analysis (CUA) that evaluates the incremental costs and the effect of a health related intervention in terms quality-adjusted life-year (QALY).

While these questionnaires are a complementary tool, the degree of agreement with specific professional tests should be determined with the similarity coefficient. This coefficient is based on the total percentage of agreement between each item and each domain that exhibit correlation and the corresponding clinical study.

The instrument that was designed to measure the teachers' perceptions of oral health would be reliable and valid. It would be recommendable to increase the sample size for our application and determine criterion-validity by comparison with other instruments.

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