Quality of life – conceptualization and special characteristics related to oral heath

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Summary

Quality of life is a multidimensional concept and its measurement is very important both for clinical decisions and for allocation of resources for health interventions. This paper reviews the literature and discusses the major issues regarding the development of instruments that could measure a patient's quality of life. The aim of the review is to provide basic information and analysis concerning the development of a health status assessment instrument from a psychometric perspective. The questionnaires are the most common instrument and the paper discusses the basic characteristics of a good one. The reliability and validity of a questionnaire are detailed, describing also methods to evaluate them.

***Key words*: quality of life, reliability, validity.**

Quality of life is a concept used a lot lately in medicine, but also in other fields (sociology, psychology, economics etc). A definition for quality of life is hard to give because there are different points of view, many of them complementary. The World Health Organization defines the quality of life as *the individuals' perceptions of their position in life, in the context of the cultural and value systems in which they live and in relation to their goals, expectations, standards and concern."* [1]. A. Campbell, one of the first specialists preoccupied with the concept of quality of life, considers it as the product of individual characteristics, objective life conditions and the subject's satisfaction towards them [2]. Some definitions try to assert a distinction between the subjective and the objective quality of life, the latter considering only the concrete aspects of the life situation. It is obvious that multiple definitions generate difficulties in establishing the elements that are needed to be considered when assessing the quality of life [3]. However, some general judgments are obvious:

- an adequate assessment of health-related quality of life should take into consideration the individual's perception of its health status;

- standardized questionnaires are necessary in this purpose, without being sure that the measurement is exact and can be generalized.

The large number of measuring instruments (over 800 in medicine) mirrors the

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inaccuracy of the definitions: some of them are generic, some are specific for certain pathology, and some are global, while some are dimensional.

Quality of life – types of measuring instruments

Global measures – are assigned to measure the quality of life in the most accessible and general ways. For example, the "Flanagan Quality of Life Scale" assesses the satisfaction level in 15 different areas of life.

Generic measures – were designed initially for descriptive goals and have a lot in common with global measures. They are applicable on large segments of population and have the advantage of allowing comparisons between the different groups. The disadvantage is that the questions are too general for revealing a punctual concept.

Specific measures – used for a specific goal or for a specific predefined workgroup and tend to have a great sensitivity. Nonetheless, they suffer from the lack of correlation with other quality of life measuring instruments. [4]

The measuring instruments can also vary as methods and the most common method is based on questionnaires.

The Questionnaire – is a set of questions, structured and standardized, which allows for quick access to the data useful for research. According to Chelcea (1975), the questionnaire "represents a technique and, accordingly, an investigation instrument consisting of a series of written questions and, eventually, graphic images, logically and psychologically ordered, which, administrated by survey operators or by self-administration, determine from the interviewed persons answers which will be recorded in written form." [5]

The administration method consists of two types of questionnaires: self-administered and administered by survey operators.

In the case of self-administered questionnaires, the subjects record their own answers. It assumes that in the absence of the operator, the subjects would be more willing to answer personal questions. It also assumes that the subjects are more willing to elaborate their answers; in reality, however, it was found that the subjects frequently avoided the answers for some questions or gave false answers. This type of questionnaires has a higher rate of errors in data collection.

The questionnaires administered by survey operators, in the form of *face-to-face*, represent the most frequent form of data collection. It allows application of longer questionnaires, detailed observations of the subject, usage of filter-questions (which stops the passing to a series of questions), the possibility of stating the answer. The second variant, the *phone administered questionnaire* gained ground because of its ease of application. While the costs are lower, it loses the data obtained from the direct observation. [5]

Types of questions. There are 3 possible categories of questions: closed questions, opened questions and semi-closed (semi-opened).

General qualities for a good questionnaire:

- It answers to the study goal;
- It is precise, concise and compatible with subjects' educational level questions;
- It does not express judgments which could influence the answer;
- It allows comparison with similar studies.

Metrological qualities of a good questionnaire (Klaparede):

- It is interesting;
- It has clear instructions;
- It excludes the chance;
- It has graded, standardized questions;

- It is issued quickly;
- It has a good dispersion;
- It is new;
- It does not to involve school knowledge;
- It allows making equivalent forms.

Scaling. A necessary consideration when developing instruments for assessing QOL is the nature of the data that is input to form the instrument. The intensity of the social and psychological phenomenon should be measured through a technique that is ordering them in a space, which is stretching from a favorable extreme to the unfavorable extreme.

In the socio-economical sciences the following scales are used: nominal, ordinal, interval and proportional.

The *nominal scale* is the most primitive. Each element has the same importance and weight. Such a scale is used only for the enumeration of possibilities. It is a non-parameter scale which allows the classification of the studied units in two or more groups whose members differ after the scaled characteristic, without leading to an ordering.

The *ordinal scale* allows a sort of opinion classification. It offers the possibility to mark the differences, as well as to set lower or upper positions.

Interval (cardinal) scale. This scale allows placing the positions of the interviewed ones on different levels and also calculating the distance between levels.

The *proportional scale* has all the characteristics of the interval scale, as well as the "point zero" of the scale, which allows performing all the calculations required by the logical analysis.

In evaluating the quality of life, some different scales are often used:

1. Discreet answers – uses responses such as good, acceptable, poor.
2. Linkert scale – uses the agree / does not agree evaluation on a series of information.
3. Visual analogy – uses a line with fixed length, which has the measuring elements only at the ends and not lengthwise.
4. Adjectival – uses a series of answers along the line; similar with the visual analogy, except the elements are lengthwise. [6]

The whole quantity of the gathered data from the measuring instruments is operated according to the interest areas and proposed goal. Specific areas referred by these measures are called indicators and include the whole area of quality of life. The indicators can refer to the following domains: medical, environmental, standard of living, cultural and educational.

The quality of life measuring instruments from the medical area are important for:

- Finding and surveillance of the psychosocial issues that appear in patient care.
- Conducting population surveys in search of health problems.
- Assessing the benefits received by the patients from medical treatments.
- Fitting the quality of life measuring instruments in the complex procedures of the medical act.
- Measuring the medical activity that can be used for evaluating the efficiency of the medical services.
- Assessing the results obtained in the clinical tests, especially those required by the pharmaceutical companies, which have as a central indicator the improvement of the patients' quality of life.

Choosing a quality of life measuring instrument in the medical area depends on some psychometrical characteristics, as reliability and validity.

The reliability of an instrument is given by its capacity to obtain similar results

after recurrent tests. It indicates if the obtained results are indeed the characteristics of the persons of whom the instrument was applied or are the effects of external or even accidental factors. For any measure of health status to be useful, it must be reliable, that is, repeated measurements made under constant conditions need to give the same result. The basic measure of test reliability is a correlation coefficient, which indicates the consistency between two independently derived sets of scores.

The test's reliability can be calculated in accordance with: the reliability over time, the results obtained after applying two equivalent measuring instruments to the same persons, and the results obtained when the measuring instrument is appreciated by different evaluators.

The reliability over time of the results is achieved by applying the instrument to the same persons at different points in time. The answers should be correlated to one another, a high correlation indicating a high reliability. The drawback of this method is that an absolute identity of the results cannot be achieved due to the variability of the persons' behaviors and to the intervention of other secondary factors such as motivation, fatigue, external disturbing factors etc.

The value of the procedure called testing/ re-testing [7] depends on the length of the period between evaluations:

- A too short period – it is possible that the subjects remembered some of the previous answers, so the two tests are not totally independent, thus obtaining a misleading higher fidelity;
- A too long period – there is a risk in obtaining different results not because the instrument's fidelity is low, but due to the fact that the characteristic has really been modified.
- A reasonable period between the applications of the instruments would be 2-4 weeks.

Applying two equivalent measuring instruments is a way to avoid the disadvantages of test-retest method. The two forms are administered within a very short time period, even balancing the order. Pearson product moment correlation coefficient is computed between the two forms, and values of .80s to .90s are acceptable for this type of reliability. In addition means, standard deviations, and standard errors of measurement should be reported for each form and these should be "quite similar" [8]. Even that this way of measuring the reliability is more widely applicable than the testretest reliability it also has limitations. A special attention should be paid to determine that the forms are truly parallel, and are independently constructed to meet the same specifications.

Measurement of the internal consistency of an instrument is the statistical quality, which expresses the need for "internal purity" of the probe. It is given by two aspects:

a) **Convergence** of all items towards the aimed objective in the assessment instrument. It is necessary not to have insignificant items because those answers can mix with the answers to the important items resulting in losing their relevancy. Thus, insignificant items can distort the probe.

The coherence of a measuring instrument requires a particular examination of each item to establish its importance toward the aimed dimension.

b) **Homogeneity** expresses the internal consistence of the measuring instrument according with the usage of a dividing procedure (the evaluation instrument is applied completely, and after that it obtains the results for each half of the items).

The **validity** concept is considered as the central aspect of psychometrics. The validity of a measure is harder to prove than its reliability, especially because there are often no comparison terms (standards), and

sometimes not even an unanimous approved definition of a broad interest concept, especially in the medical area, which is an important problem regarding the quality of life measurements. [9]

There are three kinds of validity:

- **content validity** (also known as **logical validity**) refers to the extent to which a measure represents all facets of a given social concept.
- **criteria validity (criterion-related validity) -** the extent to which scores on a test correspond to a certain criterion measure.
- **construct validity -** refers to the fit between the theoretical and methodological approaches used in a program and the assessment instruments administered.

The validity of an instrument refers to its quality of being appropriate for the measurement of a real phenomenon. There is a correspondence, a correlation between an instrument and a real situation. This correlation depends on the measuring instrument's validity and expresses its power to be valid.

It implies an instrument's capacity to measure what it should measure. The validity is obtained when comparing the results obtained after applying the evaluation instrument and the real situation. This is estimated also with the coefficient of correlation.

Types of validation

a. Predictability or empirical (empirical in a practical way) validation

Predictability is the most important type of validation for an evaluation instrument, even if it is the most complicated. This type of validation imposes the administration of the instrument, followed by the gathering of efficiency indicators for 6 months, a year, or 1.5 years post initial collection.

The problem of validation, in accordance with the difficulty of choosing of an unmixed criterion, is solving with some methods. Based on the methods, the real results will be appreciated:

- By many evaluators.
- Based on unmixed criteria given to the evaluators,
- Based on scores received by the evaluators,

The evaluator not being aware of the test results of the persons in cause, in order not to be influenced in his estimations.

b. Rival validation

The rival validation gives us the functionality and doubtless usage of the probes. It is divided in two validation manners:

1. Rival validation with an instrument already validated – consists in establishing the correlation between the obtained results of the instrument that we want to validate with the obtained results, on the same subjects, of an instrument already validated. It is obvious that the two instruments have to be similar.

If the obtained results are similar after applying the two instruments (the one that needs to be validated and the one already validated) on the same group, then the instrument needing validation is also valid.

2. Rival validation with a group of valid subjects – consists in establishing the correlation between the obtained results after applying the instrument that we want to validate on a group with the results obtained from a certain group after applying the same instrument. The test becomes valid if the results are similar.

The perfect correlation is 1.00, while 0 is the worst correlation. Usually more than one validation manners are combined.

c. Conceptual validation

The validity of a measuring instrument is not a statistical parameter that is analyzed only at the end of the test. The validity is a constant preoccupation, which starts with the construction of the instrument. So, any measuring (evaluation) instrument needs to

have a conceptual validation which refers to the hypothesis and explanatory theories for which it was built and on which the obtained results will be interpreted. Behind every measuring instrument there is a theoretical foundation, which needs to be known by the ones that use it. [10]

The choice and the formulation of the items used by the measuring instrument also depends on the conceptual validation. In fact, every instrument starts with an experiment that tests a large number of items from which the ones that prove to be most relevant for the aimed goals will be selected.

When indicating the measuring instrument's degree of validity, the nature of the group on which it was validated must be specified. A measuring instrument can have a high validity in the predictability of a characteristic when it is applied to a group, but a low validity when applied to a different group, especially if the two groups differ in age, training etc.

For each result, there are an obtained result (the person's result to the test) and a real result (the person's result in ideal conditions). The difference between the two is a measuring error. **Random error** is a reliability problem while the **systematic error** is a validity error.

Regarding the random error, a series of disturbing factors were identified. There are situations that can generate errors, such as the person's sensation that he/she is placed in an unfriendly environment or subjective factors like fatigue, hunger, anxiety or pain can also affect the measures. Administrative changes (changing the data collection procedure or clarity of the instruments) can also affect the measurements' accuracy.

Systematic errors are induced by three main causes: 1) not fully respecting the random selection procedure, 2) errors generated by non-answers, 3) covering errors.

The difficulties in defining the quality of life concept reclaim the building difficulty of a single measuring instrument, which includes all the dimensions of this concept. The instruments used for measuring the quality of life are imperfect, hence why it is needed that the tests psychometrical properties be evaluated beforehand, especially when high quality information is desired.

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