

Chapter XLVIII

Evaluation Methods for Biomedical Technology

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ABSTRACT

Over the past few years specialized tools for the measurement of the health level have been developed related to the quality of life (health-related quality of life—HRQOL) and in general they include both the objective and subjective criteria of human operation as it is illustrated through a person's individual and social activities. These psychometric tools are addressed either to adults or to children and actually elevate the health services user to a basic assessor of the effectiveness of medical interventions (medication, modern surgical techniques, biomedical equipment, etc.) and generally of the entire health system.

INTRODUCTION

The definition of health has been approached by different points of view. However, the prevailing definition is the one adopted by the World Health Organization (1948), which describes health as a “[s]ituation of complete bodily, mental and social well-being and not simply the absence of illness or infirmity.”

Due to the particularity of health, objective difficulties exist in efforts to estimate the health

status of an individual. Today, several ways of measuring health exist that reflect the variety of perceptions of health. Thus, if somebody believes that health is good physical condition, it is natural to use indicators of physical condition. If, however, social or sentimental sides of the health definition are also considered, indicators that include also these sides of health would be used.

The process of health measurement is assisted by indicators of mortality, sickness, and

positive health. The latter can be expressed itself as a subjective behavior (indicators of functional ability, general health profiles, indicators of good psychological condition, indicators of social balance, indicators of quality of life) but also as an objective reality (general indicators, indicators of general behavior, environmental indicators, socioeconomic indicators).

The utilisation of the above-mentioned indicators reflects the perception that the benefit of medical care aims at the improvement of quality of life. For that reason, these indicators are also named indicators of quality of life. Consequently, the degree of improvement of life quality for a social team constitutes the control criterion of provided medical care. Thus, such indicators constitute basic elements of the evaluation of health services, different treatments, medical operations, and so forth.

Several standardised models (questionnaires) exist for the measurement of the health status of a population concerning the quality of life (health-related quality of life, HRQOL). These tools produce a depicted plan of prosperity and portray changes of levels of natural and mental health before and after a patient's introduction to the health system.

MODELS OF HRQOL

Basic notions that can be processed by the HRQOL tools are natural and mental health through the evaluation of individual health notions. Health bodies assemble the evaluations of restrictions in individual activities (that is to say, difficulties of implementation and output in a specific activity) but also in social actions (that is to say, insufficient correspondence in the implementation of common activities) with a tool or a health plan (World Health Organization, 1997). More specifically, all the psychometric tools portray health status through a

numerical scale from 0 to 1, with death being 0 and complete health being 1. Thus, death and the quality of life are combined in a single number that can be used at the same time with other methods such as QALYs (qualitatively parked years of life), which can be used for cost-benefit analyses (Bennett & Torrance, 1996).

The HRQOL evaluation methods are subdivided into two categories: (a) adult HRQOL tools and (b) underage HRQOL tools (Tables 1 and 2). However, the sample's age-related composition is not the only application criterion for a medical result evaluation method. The selection of the assessment methods depends on a number of factors such as (a) the process means of the method (i.e., the time required to extract the results), (b) the evaluation method's reliability, possible modifications in time, and process changes, (c) the application features of the tool, and (d) the applicability of the tool content in the particular study (http://ntl.bts.gov/lib/11000/11400/11433/keynote_3.htm).

EVALUATION OF BIOMEDICAL TECHNOLOGY

The presence or absence of health symptoms does not constitute the unique criterion for conclusions with regard to the health level of an individual. The multidimensional tools of the evaluation of health-related quality of life depict the sense of prosperity in a patient through the recording of his or her psychological, social, and natural activity.

In case of the comparison of different surgical methods (a simple day operation compared to a traditionally longer one), a day operation has a limited influence on the mental health of a patient provided that he or she is allowed to return shortly to his or her way of life. It immediately exempts the patient from senti-

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