

Review

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Quality of life in patients with coronary heart disease-I: Assessment tools

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Abstract

Health-related quality of life (HRQL) assessment is an important measure of the impact of the disease, effect of treatment and other variables affecting people's lives. The review focused on the assessment of HRQL in patient with coronary heart disease (CHD) by appropriate tools. Although no consensus exists about the precise definition of HRQL, a plethora of instruments have been developed to assess it. Two broad types – generic and disease-specific – have been developed but there is some debate about their relative merits. There is a wide selection of instruments available but choice should be based on a careful consideration of an instrument's psychometric properties, the breadth and depth with which it addresses relevant health domains and the specific clinical or research purpose for which it is intended.

Introduction

There has been a rapid and significant growth in the measurement of quality of life as an indicator of health outcome in patients with coronary heart disease (CHD). In the clinical course of CHD, there are many aspects where patients' quality of life may be affected which include symptoms of angina and heart failure, limited exercise capacity of the aforementioned symptoms, the physical debility caused, and psychological stress associated with the chronic stress. Modern treatments nowadays focus not only on improving life expectancy, symptoms and functional status, but also quality of life. Thus, an improvement in health-related quality of life (HRQL) is considered to be important as a primary outcome and in the determination of therapeutic benefit [1–3]. This article will provide an overall view of how to assess HRQL, and the tools available for patients with CHD.

Health-related quality of life

Despite the widespread use of the phrase, there is no consensus on the definition of the concept of HRQL, though definitions usually refer to physical, emotional and social well-being. HRQL is a distinct construct which refers to the impact that health conditions and their symptoms have on an individual's quality of life, and, in the context of healthcare, the term HRQL is preferred over quality of life because the focus is on health. It provides a common benchmark against which can be measured the impact of different experiences and treatments for the same condition or the impact of different treatments across different conditions [4]. As a consequence, HRQL instruments have evolved in order to assess the impact of disease, effect of treatment and other variables affecting people's lives. They provide an assessment of the patient's experience of his or her health problems in areas such as physical function, emotional function, social function, role performance, pain and fatigue. Thus, HRQL can be defined as

Table 1: Validated instruments available for the assessment of health-related quality of life in patients with coronary heart disease.

Generic	Disease-specific
Sickness Impact Profile Medical Outcomes Study 36-Item Short Form Health Survey (SF-36)	Seattle Angina Questionnaire Quality of Life after Myocardial Infarction questionnaire / MacNew questionnaire Minnesota Living with Heart Failure questionnaire Myocardial Infarction Dimensional Assessment Scale (MIDAS) Cardiovascular Limitations and Symptoms Profile (CLASP)

health status and viewed as a continuum of increasingly complex patient outcomes: biological/physiological factors, symptoms, functioning, general health perceptions and overall wellbeing or quality of life [5].

While healthcare professionals may be more interested in changes in objective physical measures, patients (and family members/carers) equally interested in a therapy that changes their symptoms, physical function and social roles. HRQL instruments measure the effects of treatment on aspects where patients are continuously concerned about. Because these instruments describe or characterize what the patient has experienced as a result of healthcare, they are useful and important supplements to traditional physiological or biological measures of health status [5].

Measurement of health-related quality of life

When measuring HRQL it is important that the instrument selected measures the health dimensions relevant to that particular set of patients [5,6]. For instance, an instrument intended for use with patients after myocardial infarction (MI) should take into account the individual's responses to living with the disease, in terms of recreational, occupational, social, personal and sexual relationships, as well as the acute and chronic physical consequences of the disease [7]. This is because when someone becomes ill almost all aspects of his or her life may be affected [8].

HRQL instruments are either 'generic' or 'disease-specific' (Table 1). Generic instruments address multiple aspects of quality of life across a range of different patient or disease groups. Thus, they focus on general issues of health (or ill health) rather than specific features of a particular disease: the role of disease-specific instruments. Because disease-specific instruments comprise content specific to the disease in question they are more clinically sensitive and potentially more responsive in detecting change. Each type has its own particular strengths and weaknesses and there is some merit in combining both.

When selecting a HRQL instrument, an important issue is how well it will perform in providing the most appropriate and required information [9]. Thus, its psychometric properties (reliability and validity) should be examined [6,8]. Reliability of an instrument is normally assessed in two ways: internal consistency and test-retest reliability. The former is an estimate of homogeneity of items measuring a specific health domain and is normally measured using Cronbach's alpha coefficient. The closer the coefficient is to 1, the greater the homogeneity between the items and, therefore, the greater the confidence that can be attributed that items relate to the domain under investigation. However, caution should be noted as alpha coefficients of >0.95 can mean that several of the items are in fact measuring the same thing [6,10].

Test-retest reliability is a measure of an instrument's ability to produce data that are consistent or stable over time. It is normally determined using Cohen's Kappa or Pearson's or Spearman's correlation coefficient. Normally, levels in excess of 0.6 indicate an adequate test-retest reliability [6,10].

Validity refers to the ability of a measure to quantify the item or dimension it is supposed to measure. It should have various forms of validity. Criterion validity refers to comparable results using other instruments measuring the same variable. Content validity is the appropriateness of items to the purpose of the instrument. Face validity represents being consistent with current knowledge and expert opinion. Construct validity is the ability of the instrument to be sensitive to different levels of quality of life in a variety of patient groups. Discriminative validity is the instrument's ability to detect changes in the observed variable without provoking a 'floor' or 'ceiling' effect that reflects an inability to detect clinically significant changes at the lower or higher spectrum of quality of life.

Both reliability and validity are not one-time-only attributes: they need to be re-established when the instrument is used in a different population or culture.

Generic instruments

A number of generic instruments are commonly used in research and clinical evaluation in populations with CHD. The two most commonly used ones are the Sickness Impact Profile [11] and the Medical Outcomes Study 36-Item Short Form Health Survey [12].

Sickness Impact Profile (SIP)

The SIP [11] comprises 136 items relating to 12 'domains' of health (mobility, ambulation, domestic affairs, social interaction, behaviour, communication, recreation, eating, work, sleep, emotions and self-care). It is thus a broadly applicable instrument that measures a variety of health outcomes, including serial changes in wellbeing over time. The SIP can be interviewer- or self-administered and offers a comprehensive means of assessing wellbeing, but its relatively long length can be a disadvantage. However, it has been recommended as an appropriate generic measure in angina and MI patients [12,13].

Medical Outcomes Study 36-Item Short Form Health Survey (SF-36)

The SF-36 [14] comprises 36 items covering eight 'domains' (physical functioning, social functioning, physical impairment, emotional impairment, emotions, vitality, pain and global health). The SF-36 is a self-administered instrument which takes about 15 minutes to complete. Abbreviated forms, the SF-12 and now the SF-8, are also available and widely used, taking even less time to complete. The SF-36 has been used in angina, MI [15] and heart failure. However, although some reports suggest that the SF-12 is preferable to the SF-36 because of its brevity and acceptability to CHD patients [16], some studies in acute MI patients have found that the SF-12 scores obscure important distinctions between domains [17]. In patients with recent MI, SF-36 has been shown to be a sensitive tool for detecting improvement of HRQL after active intervention [18–20].

Disease-specific instruments

A number of instruments have been designed to examine specifically the impact of angina, MI or heart failure on quality of life. Examples include the Seattle Angina Questionnaire [21], the Quality of Life after Myocardial Infarction [22–27] questionnaire (now called the MacNew [25] questionnaire) and Minnesota Living with Heart Failure [28] questionnaire.

Seattle Angina Questionnaire (SAQ)

The SAQ [21] is a psychometrically solid disease-specific instrument designed to assess the functional status of patients with angina. It comprises 19 questions that quantify five clinically relevant domains: physical limitation, anginal stability, anginal frequency, treatment satisfaction and disease perception/quality of life. It is often used as a

HRQL instrument because seven of its 19 items relate to emotional health.

Quality of Life after Myocardial Infarction (QLMI/ MacNew) questionnaire

The original version of the QLMI [22] was designed to be interview-administered and developed to evaluate the effectiveness of a comprehensive cardiac rehabilitation programme. A slightly modified 26-item self-administered version has been used [23,24]. This questionnaire has been validated.[24,25] More recently, an improved 27-item version of the instrument, the MacNew heart disease questionnaire (sometimes known as the QLMI-2) has been reported [26]. A good deal of research is being conducted with this instrument and reference data for users is now available [27].

Minnesota Living with Heart Failure (MLHF) questionnaire

The MLHF [28] comprises 21 items with a range of responses from no, very little to very much to produce a range of scores from 0 (no disability) to 105 (maximal disability) in relation to signs and symptoms typical of heart failure, physical activity, social interaction, sexual activity, work and emotions. The reliability and validity of the MLHF are sound and it appears sensitive to changes in treatment, and thus the instrument is used extensively in studies of heart failure.

Recent reviews have critically examined commonly used generic and disease-specific HRQL instruments in patients with CHD [12,13,29–32]. All the generic instruments studied appeared to have measurement idiosyncrasies. For example, it was recommended [30] that the SIP should only be used to obtain total domain scores and should not be separated into its component scales. The SF-36 appears to achieve the best results, having fewer floor or ceiling effects, good internal consistency and a high test-retest reliability [30].

In terms of disease-specific measures, the SAQ and MLHF seem to perform well. For instance, in angina the SAQ appears more sensitive and easier to use by both patients and investigators than was the SF-36 [29]. The MacNew (QLMI-2) has had mixed reviews [30,32], though its role has been affirmed in patients with myocardial infarction and angina. Its role in patients with heart failure also showed preliminary promise.

Two recent disease-specific instruments of interest are the Myocardial Infarction Dimensional Assessment Scale [33] and the Cardiovascular Limitations and Symptoms Profile [34].

Myocardial Infarction Dimensional Assessment Scale (MIDAS)

The MIDAS [33] is an interviewer- or self-administered questionnaire that comprises 35 items covering seven areas of health status (physical activity, insecurity, emotional reaction, dependency, diet, concerns over medications and side effects). The instrument has only recently been developed and validated in the UK and further research on its utility is being conducted.

The disease-specific instruments reviewed have been developed specifically for patients with angina, MI or heart failure. However, many patients with CHD have several of these diagnoses. It has also been pointed out that patients with CHD usually have other co-morbid conditions which generic instruments may not sufficiently detect important changes [32,35]. Thus, there is a need for a disease-specific (for CHD) instrument to address this issue.

Cardiovascular Limitations and Symptoms Profile (CLASP)

The CLASP [34] comprises 37 items that yield four symptoms subscales (angina, shortness of breath, ankle swelling and tiredness) and five functional limitation subscales (mobility, social life and leisure activities, activities within the home, concerns and worries and gender). Each subscale has four to six questions and scores are weighted to provide a total for each subscale (normal or mild to severe). The CLASP has been validated in patients with chronic stable angina and further research is required before it can be recommended for routine use.

One of the difficulties facing researchers and clinicians in the assessment of HRQL is the selection of instruments: generic or disease-specific. A recent review has concluded that, overall, disease-specific instruments of HRQL are more responsive than generic ones [36]. New instruments and novel methods for measuring HRQL in patients with CHD are being developed at a rapid rate. For example, individualized instruments, such as the Patient Generated Index [32], appear promising even though they are in their early stage of development.

Conclusions

HRQL represents the effect of an illness and its treatment as perceived by the patient and plays an important role as a primary outcome measure. There is a wide selection of instruments available but choice should be based on a careful consideration of psychometric properties, relevance and suitability. It should be emphasized that many instruments currently available are rather cumbersome and time-consuming for routine application in clinical practice. There is a need for simple instruments that are responsive, easily applied and rapidly interpreted.

Author's contributions

Professor David R Thompson was involved in collection and review of information and literatures as well as manuscript writing. Some of the studies described in the manuscript was conducted by Professor Thompson.

Professor Cheuk-Man Yu was involved in literature review and final endorsement of the manuscript. Some of the studies described in the manuscript was organized by Professor Yu.

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