Subjective and objective measures of health: which is better when?

Clinicians and biomedical researchers frequently question the value of subjective measures of health. Whether a measure is subjective (based on individual awareness or experience) or objective (existing and measurable, independent of individual experiences) certainly is an important characteristic of variables related to health states. However, it is my experience that participants in such debates often confuse the distinction between variable type and measurement strategy. For example, some researchers are uncomfortable with the results of surveys about health-related quality of life and would prefer to use only data derived from medical record reviews for their analyses. It is important to understand both the inherent characteristics of the variables we are interested in and the strengths and weaknesses of different measurement strategies if we are to obtain the best possible data for health and health services studies. Below I describe a model of health status variables that includes both objective and subjective characteristics of individuals and then discuss measurement considerations associated with different types of variables.

Health is a multi-faceted concept such that multiple indicators to assess different aspects of health are needed. This in turn requires a conceptual model of the relationship between clinical variables and other measures of health-related quality of life,[1,2] in which measures exist on a continuum of increasing biological, social and psychological complexity. At one end of the continuum are biological measures such as serum albumin levels, and at the other are more complex and integrated measures such as physical functioning and general health perceptions. Which aspects of health should be measured depends on the hypotheses being tested. For example, if the hypothesis is that a particular dietary supplement will increase the number of red cells in the blood, then measures of symptoms, difficulty performing basic activities of daily living, or general health perceptions are probably not needed. Instead, a standardized assay for red cells, in which control over the measurement process is ensured and potentially confounding factors are adequately accounted for, is needed. If, however, one wants to assess the impact of improving the red cell concentration on patients' lives, it would be important to measure aspects of health-related quality of life, such as fatigue and functional status.[3] To assess the way in which individuals interpret and synthesize different aspects of health, general health perceptions need to be measured. Thus, in many studies, there should be no debate; subjective measures are an inherent part of the design.

Subjective measures can sometimes also provide accurate and efficient assessments of objective states. Physical functioning is such a variable. Patients can be asked whether they have difficulty going up and down stairs, or an observer can visit their homes to observe whether they can or cannot climb stairs.[4] This is a situation in which objective measures are available and can be more reliable and valid, if properly administered, than patient self-reports, but such methods are often prohibitively expensive. Extensive research in this area has led to the development of short, functional status measures that can be administered directly to patients very efficiently and which have excellent reliability and validity.[5] Thus, the use of such subjective measures is now widely accepted.[6]

Probably the most subjective concept in health status assessment is perceived health. A typical question used to assess this variable is: 'Overall, how would you rate your health?' Respondents usually are then provided with a five-point Likert scale (poor, good, very good, excellent) or a 0–10 rating scale on which they can rate their health. To those trained in physical or biological sciences, this type of measure may seem problematic. What exactly does this variable measure? How can one possibly interpret such a subjective impression?

This measure is known to mean different things to different people[7] and, in some ways, that is its strength. We view general health perception as an individual's synthesis of various objective and subjective information about health that integrates this information using individual weights and preferences.[2,8] Whether this is a good thing to measure is partly a matter of opinion, but it is also an empirical issue. Reasons why this variable is of theoretical interest and often important to measure have been described.[2,5] The empirical question is whether such a measure provides information that other variables do not, and/or whether it reliably predicts phenomena of interest.

One of the most compelling reasons for assessing general perceived health is that it predicts subsequent morbidity and mortality, even after controlling for other biological and health status variables.[9–12] For example, self-evaluations of health predict mortality, even after statistically controlling for the presence of health problems, disability, and/or other risk factors.[10–12] It has been found that elderly people with perceived poor health were six times as likely to die in a 4-year period than those who reported that their health was excellent – a relative risk greater than that for smoking.[12]

We do not fully understand why perceived health is such a good predictor of mortality. There may be other unmeasured objective measures of health that could reduce the residual explanatory predictive power of perceived health. However, considering the sophistication of available studies, the power of this variable is striking. Several reasons why this variable predicts mortality have been posited.[12] It may reflect a self-fulfilling prophesy. That is, people who think they are in poor health may not protect and promote their health as much as other people. Another explanation is that such ratings may capture more information than is available in other types of assessments. When individuals rate their health, they may consider family, genetic and health history information, information about their physical and social environment, and their own attitudes and expectations about health, in addition to numerous signs and symptoms related to their health. People may use their knowledge and experience to provide a more integrated and informative rating than is possible with

other variables typically available to researchers. Irrespective of which explanation is correct, data on the relationships between mortality rates and subjective states such as chest pain or general health perception should put to rest any qualms about the value of subjective measures of health.

Some researchers are uncomfortable with subjective variables because they are perceived as unreliable. Such people often think of data from medical records as 'hard' data, whereas they think of survey responses as 'soft' data.[13] Thus, rather than judging the relative theoretical value of objective and subjective measures, some researchers' selection of variables is unduly influenced by their negative opinions about the value of survey data relative to other types of information. However, medical records contain many types of data, including information about subjective states collected using unstandardized methods. For example, although a red cell count is an objective measure, it is often assessed from notes in medical records, rather than using a standardized protocol. Notes in medical records may be subject to numerous types of measurement error and bias.[13,14] Furthermore, it is important to recognize that some apparently objective measures, such as the response of malignant tumors to therapy, may be based on very subjective judgements.

Even though symptoms are inherently subjective, some researchers seem to feel more comfortable using medical record notations, rather than information from patient surveys, as symptom measures. However, a measure of chest pain collected using a standardized instrument, such as the Rose questionnaire, using rigorous sampling and survey administration techniques,[15,16] will yield a measure that is more reliable and valid than indications in medical records that were collected using different techniques by many clinicians who had their own subjective impressions of how 'sick' an individual patient was.

Many 'objective' or partly objective variables, such as functional status, probably are best measured using objective methods. However, it is important to recognize that abstracting such information from medical records does not mean that it is 'objective'. Medical records frequently contain functional assessments that were obtained by health care professionals with no training in standardized measurement and that are largely subjective measures. Such variables may be measured more efficiently, reliably and validly with standardized subjective measures.

Many clinical, health services and health policy studies test hypotheses based on subjective variables. We need to learn a great deal more about individual variations in how people perceive, interpret and report subjective states such as symptoms and general health perception. Nevertheless, concern about reliability and validity, although always an over-riding research consideration, should not preclude considerations of subjective variables since extensive methodological research on the measurement of such variables has led to techniques that allow researchers to measure them with a level of reliability and validity that frequently exceeds the assessment of objective states.[14] The types of variables to be assessed in any given study should be determined on the basis of the hypotheses being tested, not on poorly founded opinions about the value of different data collection strategies.

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