(Health-Related) Quality of Life as an Outcome in Studies of Axial Spondyloarthritis

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KEY POINTS

- In axSpA, stiffness, pain, mobility limitations, fatigue, and sleep problems are the most prominent health concerns and restrictions that influence the life of patients.
- HRQoL or overall health measurement instruments integrate the broad range of health impairments that affect the daily life of patients in one (composite) measure.
- Health utilities are a specific type of HRQoL instruments that account for preferences of the different aspects of health included in the instruments.
- QoL is a much broader construct compared with overall health or HRQoL and links to happiness or satisfaction with life as a whole.
- Although a large amount of literature studied overall health/HRQoL among persons with axSpA, research on QoL is scarce.

INTRODUCTION

Because axial spondyloarthritis (axSpA) begins in early adulthood, impairments in various aspects of health accompany patients lifelong.[1-5] As a consequence of the different impairments and limitations, patients face restrictions in participation in diverse social roles.[6-8] For the purpose of clinical studies there is an interest to assess the direct consequences of the inflammatory process on specific body functions (eg, pain and stiffness, fatigue, movement functions) and body structures (structural changes in sacroiliac joints or spine), because this information can directly guide drug treatment. However, it is equally important to measure the broader range of impairments that can affect patients, and integrate these into

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one measure of overall functioning in daily life. Such tools help to evaluate the over-all care provided to patients. Retrieved information can identify unrecognized needs and helps to complete and prioritize the overall management axSpA. To facilitate measurement of the overall impact of a disease on the life of persons, several measurement instruments have been developed. However, complex con-structs, such as overall health, cannot be measured currently by objective approaches, and measurement instruments rely invariably on person-reported methods. Information on overall health is retrieved either by relying on a global, im-plicit assessment of health, or by using composite measures that approach the complex construct more explicitly by integrating its main defining aspects. Initially, measures to assess impact of disease on overall health were called health mea-surement instruments, but in the 1980s the term "health-related quality life (HRQoL) instruments" was introduced. This term might actually result in misconceptions or wrong expectations about what the available instruments actually measure, because HRQoL measures do not assess quality of life (QoL). Several definitions for QoL have been proposed, and they all point to the individual's perception of life as the core of this concept. Alternative terms related to QoL are "life satisfac-tion" or "happiness." The World Health Organization defines QoL as "a broad and multidimensional construct that reflects the individuals' perception of their po-sition in life in the context of culture and value systems, and in relation to goals, ex-pectations, standards and concerns." Although this construct is increasingly relevant at the population level, it is a too broad and ill understood construct to be operationalized in health care, where the focus is still on concerns related to medical conditions or health impairments. Because a large amount of evidence revealed that health impairments are the key determinant of a person's QoL, the construct HRQoL evolved in the 1980s.[9] It might be clear that both constructs (QoL and HRQoL/overall health) are distinguishable in two main aspects that are determinant for the development of measurement instruments. First, QoL and HRQoL (or overall health) differ in content. Although HRQoL/overall health focuses on aspects of health, such as seeing, hearing, pain, anxiety, moving around, and work-ability, QoL additionally refers to social well-being, material well-being, self-esteem, and self-determination. Second, the dimension of measurement varies. Although HRQoL is mainly operationalized by assessing the level of impairments and/or limitations (eg, amount of pain, amount of difficulty/ability to get up form a chair), QoL additionally concerns the level of satisfaction with the determining aspects. It is clear QoL is characterized by a higher level of appraisal related to the responder's personal and environmental context (Table 1).

In addition the health and HRQoL, alternative names for instruments that integrate the impairments into one health measure, have been proposed. Recently, the Interna-tional Classification of Functioning, Disability and Health (ICF) proposed the term "functioning" to refer to the health impairments and limitations as a consequence of disease. Functioning was also chosen as the positive alternative for the older construct "disability." According to the ICF health is considered to reflect the experi-ence of disease (functioning) when accounting for the role of contextual factors as facilitator or barriers on functioning and QoL is actually suggested by the ICF research branch to be a personal factor (appraisal). In the current overview, the term "overall health" is used in parallel to HRQoL, because the latter is commonly used. Notwith-standing, we hope to reinstitute the term "overall health" or propose the term "func-tioning" because these terms better reflects the content and aim of this group of measures. We also want to stimulate the discussion whether more research into true QoL is needed.

Table 1
Similarities and differences in content and dimension of measurement of overall health (or HRQoL) and QoL measurement instruments

	HRQoL (Functioning, Overall Health)	QoL (Life Satisfaction, Happiness)
Content of the construct	Physical health (pain, fatigue, daily activities) Mental health (anxiety, depressive symptoms) Participation (participation in social roles)	
		Material well-being Social-position Self-determination Self-worth
Dimension of measurement	Aimed to be objective (limited influence of personal appraisal and environmental context) Impaired, limited, restricted (difficulty/discomfort) Able to do/perform	Mixed objective and subjective (large influence of personal appraisal and environmental context)
		Satisfied/happy Able to be

FRAMEWORKS RELEVANT TO DEVELOP MEASURES FOR OVERALL HEALTH OR HEALTH-RELATED QUALITY OF LIFE

Health, Well-Being, and Quality of Life According to Patients with Axial Spondyloarthritis

A mixed qualitative-quantitative study investigated whether patients with axSpA (n = 68) consider health, well-being, and QoL to be different constructs and explored whether the view of patients differed from control subjects without SpA (n = 84).[10] Patients scored on all constructs significantly worse on a 0 to 10 numeric rating scale (10 best) compared with control subjects (mean, 6.1–6.3 vs 7.2–7.6; all P<.01). Within groups, no significant differences in scores between constructs were found. The quantitative part of the study revealed patients identified more themes related to health, and almost all patients associated health-related themes also with well-being and QoL, whereas this was more rarely the case for control subjects. Emotional functions were relevant to well-being for all participants. Social aspects, work-satisfaction, and financial situation were more frequently related to well-being and QoL by control subjects compared with patients (Fig. 1).[10]

Overall, the study indicated that for persons with and without health impairments health, well-being, and QoL are different but related constructs, and that for patient's health constitutes a stronger part of QoL than for individuals without SpA. In this study, well-being and QoL were explored as a separate construct, and findings suggested well-being was considered as an individual experience, whereas QoL related more strongly to social experiences. Of note, patient's fear of side effects contributed to well-being. Remarkably, such aspects as self-determination (being free) or
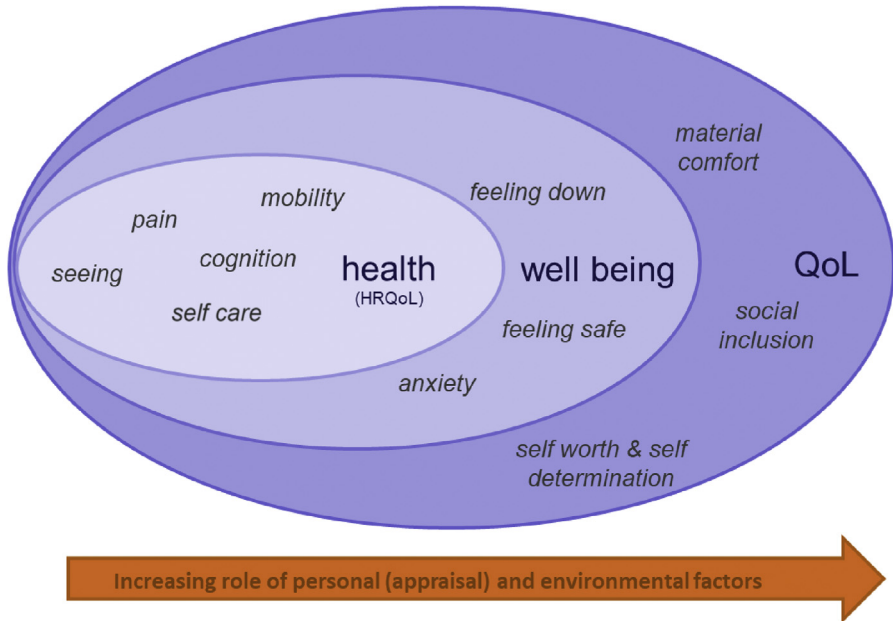
Fig. 1. Health is only a part of well-being and quality of life for patients with and without axSpA. *Data from* van Tubergen A, Gulpen A, Landewe R, et al. Are globals for health, well-being and quality of life interchangeable? A mixed methods study in ankylosing spondylitis patients and controls. Rheumatology (Oxford).2018;57(9):1555-1562.)

self-esteem (discrimination) were not brought forward, likely as a consequence of selection of participants in a country with high respect for human rights.

Which Aspects of Functioning and Health Are Important for Axial Spondyloarthritis

The interest to assess the impact of disease on a person's overall functioning and health emerged only in the second half of the twentieth century. The World Health Organization recognized the need for a model and information system to describe overall functioning and health. In 2001, the ICF was endorsed by the World Health Assembly as the universal framework and classification. The ICF framework adheres to the bio-psycho-social model of disease and recognizes that functioning and health results from a complex interplay of the functioning and disability components, body functions and body structures, and activities and participation, with contextual factors that consist of environmental and personal factors. In addition to the framework, the ICF also offers a universal and hierarchical classification of functioning by means of so-called categories that are seen as the units of health that are necessary to define and classify functioning (Fig. 2).[11]

The ICF classification comprises 1545 hierarchical structured categories divided over the previously mentioned ICF components (except for personal factors, for which no classification is as yet available). To make the ICF classification applicable in health care, ICF Core Sets have been developed for specific diseases or specific situations.[12] ICF Core Sets are selections of ICF categories that are necessary to describe the impact of the disease on functioning and health. Disease-specific Core Sets are developed following an elaborate standardized process that includes
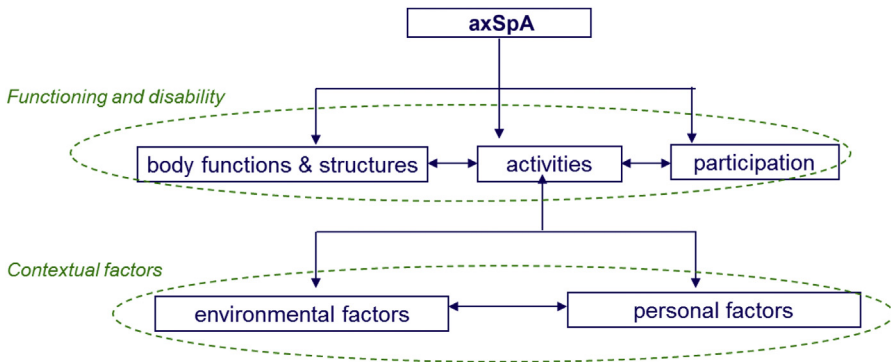
Fig. 2. The bio-psycho-social framework of health of the World Health Organization that is the basis for the International Classification of Functioning, Disability and Health. AS, ankylosing spondylitis. (*Adapted from* (WHO) WHO. The International Classification of Functioning Disability and Health. Vol https://apps.who.int/iris/bitstream/handle/10665/43737/9789241547321_eng.pdf;sequence=1. Geneva2001.)

the perspective of clinicians, health care professionals, researchers, and patients. Two types of Core Sets are distinguished: the Comprehensive ICF Core Sets, which represent the external reference of functioning and is used for research and in rehabilitation settings. The Brief ICF Core Sets are primarily intended for clinical studies. Table 2 presents the categories (aspects of health) of the brief ICF Core Set for axSpA across the different components.

Because the ICF Core Sets provide information on what to measure, they constitute an evidence-based starting point to develop outcome measurement instruments for functioning and health. The first step toward how to measure is to develop a databank of items measuring each of the ICF health aspects (categories). Using items derived from such effort for axSpA in a best-worse scaling experiment, allowed to rank the aspect of health according to their importance (0%–100%) for patients with axSpA (n = 199).[13] It was shown (Fig. 3) that highest relative importance was assigned to pain (b280: 14.2%; 95% confidence interval [CI], 13.8–14.6), sleep (b134: 10.3%; 95% CI, 9.6–11.0), being exhausted (b130: 9.6%; 95% CI, 9.0–10.3), standing (d410: 9.25%; 95% CI, 8.5–10.0), and motivation to do anything that requires physical effort (b455 and d230: 8.7%; 95% CI, 8.1–9.3). Differences between subgroups (man and women; axSpA and peripheral SpA) and between countries were small or in aspects with lower importance. Such information might be worthwhile when deciding whether items should be weighted in a measurement instrument.

Measurement Properties of Person-Reported Measurement Instruments

Although it is essential for any measurement instrument that the content is based on sound theoretic frameworks and represents the perspectives of different stakeholders, the instrument also needs to have appropriate clinimetric measurement properties summarized as validity (truth), reliability and responsiveness (discrimination), and usability (feasibility). Truth captures issues of face, and content validity as described previously, but also construct validity, that is, concordance or discordance with external constructs that are hypothesized to be respectively related or unrelated to overall health of HRQoL. Situations of discrimination can be states at one time (for classification or prognosis) or states at different times (to measure change). Discrimination captures issues of reliability and sensitivity to change. Usability or feasibility

refers to constraints of time, money, and interpretability of the instrument. These aspects may be decisive in determining a measure's success.[14] Although content (selection of type and number of items) is essential for validity and psychometric properties, also attribution (disease-specific or generic), answer scale, recall (eg, current or last 4 weeks), and whether or not items are weighted in the final score have a major influence on clinimetrics.

With regard to all measurement characteristics of self-reported instruments, it is important to emphasize they are developed for application in clinical studies. The large intraindividual variations and low ability to detect deterioration make them unsuitable for use with individual patients.

MEASURES OF FUNCTIONING AND HEALTH OR HEALTH-RELATED QUALITY OF LIFE APPLIED IN AXIAL SPONDYLOARTHRITIS

Generic and disease-specific questionnaires have been developed and used to assess possible limitations of overall functioning and health in patients with axSpA. Generic instruments most frequent applied in axSpA are the Short Form-36 (SF-36), the Short Form-12 (SF-12), and the EuroQoL (EQ) thermometer and EuroQoL five dimensions (EQ5D) utility index.[15,16] Disease-specific questionnaires are the Ankylosing Spondylitis Quality of Life (ASQoL) scale, the Assessment of Spondyloarthritis International Society Health Index (ASAS HI), and the ASAS utility index.[15–18] Health utilities are a special type of overall health of HRQoL instruments, because they weigh the value or preference persons have for the different aspects of health that constitute the composite health measure. Overall, generic instruments are less specific for

Table 2 ICF categories included in the brief ICF core set for axSpA		
ICF Component	**ICF Code**	**ICF Category Title**
Body functions	b280	Sensation of pain
	b710	Mobility of joint functions
	b780	Sensations related to muscles and movement functions (stiffness)
	b130	Energy and drive functions
	b134	Sleep functions
	b152	Emotional functions
	b455	Exercise tolerance functions
Body structures	s760	Structure of trunk
	s740	Structures of the pelvic region
	s770	Additional structures of musculoskeletal system
	s750	Structure of lower extremity
Activities and participation	d230	Carrying out daily routine
	d410	Changing basic body position
	d450	Walking
	d845	Acquiring keeping and terminating a job
	d850	Remunerative employment
	d760	Family relationships
	d930	Recreation and leisure
	d475	Driving
Environmental factors	e110	Products or substances for personal consumption
	e3	Support and relationships

Data from Kiltz U, Essers I, Hiligsmann M, et al. Which aspects of health are most important forpatients with spondyloarthritis? A Best Worst Scaling based on the ASAS Health Index. Rheumatology (Oxford). 2016;55(10):1771-1776.

difficulties experienced by patients with a certain disease but they have the advantage that comparison between disease or with the general population is possible.[19,20]

Generic Instruments Used for Assessing Health-Related Quality of Life in Patients with Axial Spondyloarthritis

EuroQoL Visual Analogue Scale

The EuroQoL Visual Analog Scale (EQ-VAS) thermometer is a single self-reported global question asking respondents to rate current health on a VAS with end points labeled best imaging health (100) and worst imaging health (zero).[16] The EQ-VAS is part of the EuroQoL instrument that also includes the EQ5D health utility (see later). The EQ-VAS is likely underused and underinvestigated in axSpA. The instrument is easy to administer and provides a summary of overall health that is close to the patient's experience. The advantage of being implicit might be considered at the same time a disadvantage, because underlying factors driving the scores remain unclear. Although end-of-scale aversion is a known limitations of the VAS, the instrument is reliable and sensitive to change.

The Short Form-36 and Short Form-12

The SF-36 is a 36-item composite self-report measure designed as a short, generic assessment of health including physical functioning, physical and emotional roles, bodily pain, general health, vitality, social functioning, and mental health.[15] The domain summary scores range from 0 to 100 with higher scores indicating better levels of function and/or better health. The main components of SF-36 are subscores for physical (physical component score [PCS]) and mental health (mental component score [MCS]). The scale scores are calculated by summing responses across scale items and then transforming these raw scores to a 0 to 100 scale.[21] Recall period
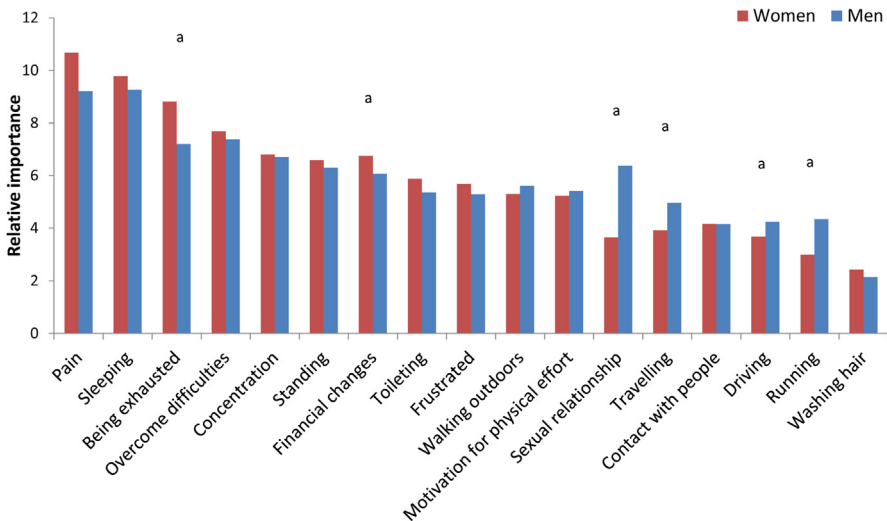

Fig. 3. The relative importance of the 17 items selected for the Assessment of Spondyloarthritis International Society Health Index as revealed in a best-worst scaling experiment separately for men and women. [a] Statistically significantly different. (*Adapted from* Kiltz U, Essers I, Hiligsmann M, et al. Which aspects of health are most important for patients with spondyloarthritis? A Best Worst Scaling based on the ASAS Health Index. *Rheumatology (Oxford).* 2016;55(10):1771-1776.)

depends which form is being used (standard 4 week, acute form 1 week). The SF-36 has been used to capture health in the general population and a variety of diseases including rheumatologic diseases. The availability of standardized population scores facilitates comparisons between patients and healthy individuals and between diseases. Many studies consistently showed that in patients with axSpA the PCS and MCS are reduced when compared with the general population.[20,22,23] Scores for PCS of patients with axSpA have values between 30 and 50, and for MCS values are between 40 and 50.[20] Overall, the psychometric properties are good for the SF-36. However, its validity has been questioned because presence of severe floor and ceiling effects indicates that it does not capture the full range of health experiences in rheumatologic settings. In general, reliability is better for physical health (intraclass correlation coefficient (ICC) $\geq$0.70) compared with mental health (ICC 0.55).[21] Sensitivity to change for the MCS is low, not only in axSpA but also in other diseases, pointing to an instrument characteristic. According to the SF-36 manual a difference of five points on an SF-36 score is considered "clinically and socially relevant," whereas some trials use a greater than or equal to three-point increase in the SF-36 PCS for an individual patient as a minimal clinically important improvement.[22,24] The SF-12 is a shortened version that contains 12 of the original questions and from which a physical and mental component summary score can be calculated.[25] PCS-12 and MCS-12 were found to be highly correlated with their SF-36-derived counterparts (PCS, r = 0.94; MCS, r = 0.96), and produce remarkably similar results, in the community sample and across a variety of patient groups. A disadvantage in rheumatology is the absence of questions on vitality (fatigue). For this reason, researchers often add the three vitality questions to their survey.

Disease-Specific Instruments Used for Assessing Health-Related Quality of Life in Patients with Axial Spondyloarthritis

The Assessment of Spondyloarthritis International Society Health Index

The ASAS HI was developed to cover the entire spectrum of possible limitations of global functioning in patients with SpA.[17,26] The content of the ASAS HI was based in the ICF Core Set for axSpA and thus represents perspective of aspects of health typical and important according to patients, health care providers, and researchers. The ASAS HI contains 17 dichotomous items covering represented categories, such as pain, emotional function, sleep, sexual function, locomotion, independence, social life, and working life. The sum score of the ASAS HI is between 0 (good functioning) and 17 points (poor functioning). To differentiate between poor, moderate, and good functional ability, threshold values were determined (good functional ability, <5 points; poor functional ability, $\geq$12 points). An improvement of greater than or equal to three points (smallest detectable change) in an individual patient is considered to be larger than measurement error and thus points to true change.[17] The ASAS HI also includes a nine-item contextual factor set (environmental factors only) and is thus a true health measurement instrument as proposed by the ICF framework and terminology. Although the content validity was guaranteed in its development phase, the clinimetric role in measurement properties should still be evaluated.

The Ankylosing Spondylitis Quality of Life Scale

The ASQoL measures the impact of ankylosing spondylitis (AS) on HRQoL from the patient's perspective.[27] This self-reported questionnaire includes 18 items on domains, such as sleep, mood, motivation, coping, activities of daily living, independence, relationships, and social life.[28] The total score is the sum of the individual, dichotomous responses and ranges between 0 and 18, with higher scores reflecting

greater impairment. The questionnaire has been demonstrated to be feasible, reliable, and to have content and convergent validity in patients with axSpA.[29] Content validity is high in this questionnaire because the measure was derived from patient interviews. Patients need between 2 and 16 minutes to complete the questionnaire and it takes less than 1 minute to score the results.[28] High level of reliability was observed for patients with AS (ICC >0.9).[30] The minimal clinically important difference was identified as a change of greater than or equal to three points for both directions, improvement and worsening.[31] However, usability might be interfered by a copyright license.

Health Utilities

Traditional composite health measurement instruments do not account in their scoring for the value persons attach to the different aspects of health included in the instruments. This is surprising, because it has been shown repeatedly that different items in a composite instrument are not equally important for overall health. In choice experiments, respondents are forced to indicate their preference for different health states (ie, combinations of aspects and level of impairments of health). Different preference elicitation methods (ie, choice experiments) are available, such as standard gamble and time trade-off, or more recently best-worse scaling or discrete choice experiments.[32–34] Health utilities are preference-based instruments and valuation approaches that anchor the value (preference) of health states on a 0 to 1 scale, in which zero corresponds to a state equivalent to death and 1 perfect health. Values lower than zero refers to states worse than health. This common scaling between 0 and 1 allows comparison of (changes in) health valuations between conditions. The preference experiments are performed using health states derived from existing health instruments (eg, SF-36 or EuroQoL) and the algorithms derived from the experiments can subsequently convert the scores on the original measures into a health utility index. This health-questionnaire based approach is called an indirect utility valuation. When health utility values are integrated over time (ie, years), quality-adjusted life-years are obtained, which represent the life impact of the disease on valued health. Quality-adjusted life-years are useful when rational choices have to be made by decision makers when allocating resource in health care and to research across different diseases or interventions (eg, in health economic evaluations).

For allocation of societal resources, it is considered appropriate to account for the societal perspective on health preference. Persons that do not suffer from major health problems are invited to value the health profiles of persons with impairments along the choice experiments. Notwithstanding, the patient perspective is increasingly accounted for, because patients know better what it means to live with health impairments.[35] On the same line, disease-specific health utilities are being developed.[36] These disease-specific utility valuation approaches are especially valuable when comparing effects of health preferences of interventions in specific diseases. For example, for patients with axSpA sleep and fatigue are relevant with regard to overall health. Notwithstanding, these aspects of health are not part of most generic health utility valuation approaches.

The generic EuroQoL five dimensions health utility index

The EQ5D provides societal preferences for health states (health utility) across five dimensions of health: (1) mobility, (2) self-care, (3) usual activities, (4) pain/discomfort, and (5) anxiety/depression.[16] Two versions with a difference in response options have been published: a three-level (no problems, some problems, and extreme problems) and five-level version (no problems, slight problems, moderate problems, severe problems, and extreme problems). Individual profiles created using the five

dimensions of the EQ5D are called the EQ5D Health State. Individual scores are converted, based on experiments within the general population, into a summary called the societal EQ5D Index. The EQ5D Index uses a utility-weighted scoring system that has been derived from extensive studies with different countries.[37] In studies, the EQ5D value is given for patents with axSpA with values between 0.6 and 0.8.[8] Overall, the psychometric properties are good for the EQ5D. Among patients with AS, floor effects in the five dimensions ranged from 10.4% (pain/discomfort) to 61.7% (self-care) and ceiling effects ranged from less than 1% (mobility) to 20.2% (pain).[38] Test-retest reliability for the EQ5D Index ranges from ICC of 0.64 to 0.78 for patients with rheumatoid arthritis (no specific values are available for patients with axSpA).[39] The EQ-VAS, by some considered to be a disease-specific and patient preference valuation because the VAS implicitly weighs all aspects of health into one score, is more responsive compared with the EQ5D.[38]

The axial spondyloarthritis–specific Assessment of Spondyloarthritis International Society utility index

Using the 17 health items of the ASAS HI, two consecutive preference experiments were performed among 3099 subjects without SpA to understand the relative importance of each of the 17 items, and rescale them on 0 to 1 utility scale.[40] The societal conversion algorithm indicated a health utility of −0.24 for worst SpA, and 0.88 for best health. The mean utility among 199 patients with SpA was 0.36 (standard deviation [SD], 0.30; range, −0.24 to 0.88) and discriminated well between patients having high or low Bath Ankylosing Spondylitis Disease Activity (BASDAI; ≥4, 0.18 [SD, 0.24] vs BASDAI <4, 0.51[SD, 0.27]; $P<.01$).

CORE OUTCOMES, CONTEXT, AND REFERENCE SHIFT IN RELATION TO OVERALL HEALTH OR HEALTH-RELATED QUALITY OF LIFE

One of the aims to measure overall health or HRQoL is to understand the relationships between several health outcomes in axSpA, because this helps to identify point of priority in research or care. Based on pretreatment data of 214 patients with AS, hierarchical associations between HRQoL assessed by the SF-36 physical and mental component, physical function (Bath Ankylosing Spondylitis Functional Index), clinical disease activity (BASDAI), spinal mobility (Bath Ankylosing Spondylitis Mobility Index), structural damage (modified Stoke Ankylosing Spondylitis Spinal Score), MRI inflammation, disease duration, age, gender, body mass index, and HLA-B27 were explored. The resulting model is visualized in Fig. 4. Physical function and disease activity were independently associated with the physical component of SF-36 and
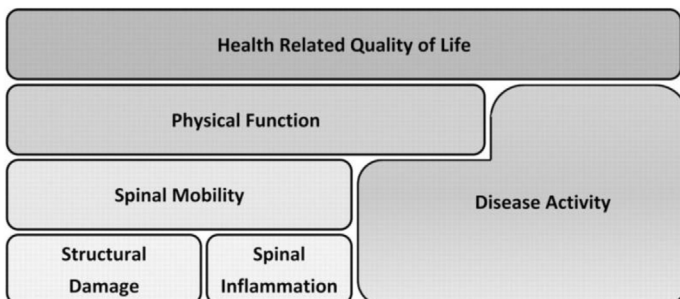

Fig. 4. The hierarchal relationship among key outcome measures in axSpA.

physical function also, but to a lesser extent, with the mental component of SF-36. Physical function was also independently associated with measures of spinal mobility and disease activity. Spinal mobility was an intermediate variable between structural damage and physical function.

Increasingly, contextual factors receive attention in outcome research. Contextual factors are factors that are not the outcome, but should be considered, because they are essential when interpreting the outcome or the effect of the intervention on the outcome. Contextual factors can distort, confound, or modify work outcomes. The ICF additionally states contextual factors do not belong to the functioning and disability component, and distinguishes personal and environmental factors. Limited research is available on the role of contextual factors in axSpA. One study examined the effect of gender among 216 patients with axSpA in the OASIS longitudinal study.[41] In multivariable analysis, male gender was significantly associated over time with a better ASQoL (B = -1.18; 95% CI, -2.17 to -0.20; P = .02), and in a separate model with a higher mSASSS over time (B = 8.24; 95% CI, 4.38 to 12.09; P<.01). Another study among 522 patients with axSpA from Canada and Australia explored the cross-sectional association between nationality, ethnicity, marital status, education, employment, and helplessness, adjusted for disease activity and physical function (BASDAI and Bath Ankylosing Spondylitis Functional Index) in relation to ASQoL and EQ5D. Contextual factors explained 37% and 47% of the variance in EQ5D and ASQoL.[8] Helplessness and employment were the most important contextual factors. When ASQoL was the outcome, employment had a positive effect on ASQoL among higher educated persons and helplessness had a negative impact on EQ5D among lower educated persons. It is surprising that no studies evaluated the role of side effect on QoL of patients. Specifically, it is not clear whether side effects are sufficiently represented in current measures to reflect the impact on patient's functioning and health. Another outstanding (research) question is which contextual factors are modifiable and could receive attention in clinical care. A special form of systematic bias (distortion/confounding) in outcome assessment is response shift. Response shift helps to explain the disconnect that can be observed when the disease worsens objectively over time, but patients report stable or even better outcome. Biologic response modification in response to stress has been advocated as a potential pathway, but also psychological reinterpretation of the impairments and limitations, called response shift, has been proven. In this psychological pathway, response shift can occur when patients reconceptualize the target construct, reprioritize the aspects within the construct, or redefine the standard of measurement (the maximum for optimal health is recalibrated). In axSpA adaptation or response shift has not been evaluated for overall health or HRQoL, but was studied for well-being (the Bath Ankylosing Spondylitis Global Assessment among 86 patients with axSpA that had been treated for on average 3.3 years with infliximab).[42] Patients re-evaluated (after 3.3. years) their well-being on a 0 to 10 numeric rating scale (10 very severe effect on well-being) when starting treatment with infliximab 3.3 years earlier using a retrospective assessment (the so-called "then-test"). Using the then-test, patients rated their overall well-being at the start of infliximab 7.2 (SD = 2.3), and the actual score at that time was 7.0 (SD = 1.6; P = .45). Time elapsed did not influence the then-test (P = .13) and there was also not influence of age, gender, or disease duration on the gap between initial and retrospective assessment. As patients remembered correctly the impact of axSpA on well-being, the then-test in this specific study setting could not prove evidence of adaptation or response shift in axSpA. It cannot be excluded that patients remembered how they well adapted and accounted for this in their retrospective score.

QUALITY OF LIFE IN AXIAL SPONDYLOARTHRITIS

The Bath Ankylosing Spondylitis Global Assessment was introduced by Jones in 1996 to measure the effect of axSpA on the respondents' well-being.[43] It consists of two items scored on a 0 to 10 VAS (10 very severe effects, the first estimating well-being over the last week, and the second over the last 6 months). Construct validity with other patient-reported outcomes was moderate to good (r = 0.40–0.74), test–retest reliability was good (r = 0.84 for 1 week; r = 0.93 for 6 months), and satisfactory sensitivity to change was reported (pre-post difference, -1.54 point; standardized error of mean, 0.31; P = .001).[43] The minimal clinically important difference from the patient's perspective has been reported as 15 mm or 27.5%, with a sensitivity of 0.61 and specificity of 0.74, determined using receiver operating characteristic curve analyses.

One study compared QoL between 246 patients with axSpA and 510 control subjects without axSpA using Satisfaction Work Life Scale (SWLS).[44] The SWLS was created in 1985 and addresses the individual's cognitive judgment of their satisfaction with their life as a whole across five dimensions (eg, the condition for my life are excellent, I'm satisfied with my life; If I could live my life over, I would change almost nothing).[45] Each statement is assigned scores from one to seven. The study aimed to test the hypotheses that participation in social roles participation contributes to life satisfaction. Patients with axSpA were more frequently (extremely) dissatisfied with life (17.9% vs 8.6%). Less physical difficulty or higher satisfaction with interpersonal relations and with leisure activities were associated with higher SWLS, and this was somewhat stronger in patients than in control subjects. In employed control subjects, but not in employed patients, satisfaction with work participation was independently associated with SWLS. Income was associated with SWLS only in control subjects. The study speculated that personal relationships and leisure activities, which are typically ignored when treating AS, might help to improve the reduced life satisfaction.

SUMMARY

QoL is essentially different from HRQoL. Although HRQoL refers to the various impairments and limitations that patients experience in daily life as a consequence of their health condition, QoL aims to evaluate the satisfaction with life as a whole. The term "overall health" measurement instruments would be a more evident and transparent term than HRQoL measurement instruments. Several self-reported instruments to assess overall health have been developed and validated for application in axSpA. The health utility measures mainly differ from other available multi-item measures for overall heath, by accounting for the importance individuals have for the various aspects of health (preference valuation). Head to head comparison of instruments is lacking, but given their individual validity, the choice for clinical studies should be based on content and feasibility in the specific study. Evidence confirms overall health in axSpA is hierarchically the resultant of disease activity, spinal mobility, and physical function, which are driven themselves by inflammation and radiographic damage characterizing etiopathology of axSpA. Limited evidence on the role of contextual factors points to the relevance of education and helplessness, a personality trait. A currently ongoing research project will answer the question whether and how a contextual factor item set needs to be taken into account when interpreting HRQoL outcomes.

Only few studies address QoL in axSpA and limited evidence indicates satisfaction with life is reduced when compared with the general population. This study pointed to the importance of relationships with family and friends for QoL of patients. More research into well-being and QoL is needed, followed by a discussion of what the role of health care is in relationship to improving the nonhealth component of QoL.

Current measures for overall health have been developed to assess outcome at the group level and the large intraindividual variations and low ability to detect deterioration preclude use in individual patients. In an era where self-reported health measurement instruments are increasingly used in clinical practice, validity of measurement at the individual level should receive more attention. Experience-based sampling,[46] computer-assisted testing, and individualized questionnaires[47] are promising instruments to serve this goal.

DISCLOSURE

Authors have nothing to disclose.

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