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Assessment of Quality of Life in Musculo-Skeletal Health

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Abstract

Musculoskeletal disorders affect morbidity, quality of life and mortality, and represent an increasing economic and societal burden in the context of population aging and increased life expectancy. Improvement of quality of life should be one of the priorities of any interventions to prevent and treat musculoskeletal disorders in the ageing population. Two main approaches, namely generic and disease-specific instruments, can be applied to measure health-related quality of life. Among the generic tools available in scientific literature, the short form 36 questionnaire (SF-36) and the Euroqol five item questionnaire (EQ-5D) are two of the most popular

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Conflict of interest

Charlotte Beaudart, Olivier Bruyère and Jean-Yves Reginster are the shareholder of SarQoL® sprl. Others authors have no relevant competing interests to declare.

questionnaires used to quantify the health related quality of life in people with musculoskeletal disorders. However, because generic tools may not always be able to detect subtle effects of a specific condition on quality of life, a specific tool is highly valuable. Specific tools improve the ability to clinically characterize quality of life in subjects with a specific musculoskeletal disorder, as well as the capacity to assess changes over time in the QoL of these subjects. The recent development of specific tools should help to validate preventive and therapeutic interventions in this field.

Introduction

With population aging and increased life expectancy, people are now living longer and are becoming increasingly susceptible to non-communicable diseases, in particular musculoskeletal disorders¹. Musculoskeletal diseases increase with age and represent the 4th leading contributors to disease burden in older people after cardiovascular diseases, malignant neoplasms and chronic respiratory diseases². Their burden also increases with age and will further increase with ageing of the global population³. The burden attributable to musculoskeletal disorders is estimated having increased by 46% from 1990 to 2010⁴. The increase of socio-demographic status also contributes to higher disability-adjusted life-years (DALYs) associated with musculoskeletal diseases⁵.

Musculoskeletal aging is a very large phenotype including four main conditions, osteoporosis, osteoarthritis, sarcopenia and frailty, which are associated with adverse outcomes such as falls, fractures, functional decline or increased mortality^{6–10}. All of them highly affect disability and independence levels, quality of life and demands on health systems^{11–13}. For instance, at the age of 50, the lifetime risk of any osteoporotic fracture lies within 50% in women and 20% in men, and further increases with advancing age^{14,15}. Osteoporosis is a major risk of fractures, but sarcopenia itself also increases the risk of fracture^{16,17}, possibly via an increase of the risk of falls¹⁸. A vicious circle of musculoskeletal aging arises, leading to chronic pain, loss of mobility and slowness with their multiple clinical and societal consequences¹⁹.

Burden of musculo-skeletal disorders

Patients with musculoskeletal disorders experience loss of mobility, of independence, higher rates of institutionalisation and higher mortality rates. As a consequence, all musculoskeletal disorders significantly impairs patients' health-related quality of life^{20–23}, and generate at the societal level high direct and indirect healthcare costs. Among injuries resulting from low trauma falls, hip and vertebral fractures lead to the greatest activities of daily living limitations immediately after the fall²⁴. Only 40 to 70% of hip fracture survivors recover their pre-fracture level of mobility, ability and independence to perform activities of daily living, and a substantial proportion requires assistance for various tasks in the 2 years after fracture, although they were independent before fracture²⁵. Fractures also generate high hospital and healthcare costs which can remain above pre-fracture levels 5 years following the index fracture^{26,27}. In Switzerland during 2000, the overall incidences of hospitalization due to fractures were 969 and 768 per 100,000 in women and men, respectively, showing

that osteoporosis continued to be a heavy burden on the healthcare systems^{28,29}. There is a high risk of transfer to a long-term care facility following osteoporotic fractures, reaching 10 to 30% of patients in the year following hospital discharge after hip fracture^{25,30}. This risk is about 3 times greater after hospitalization for a hip fracture or other fall-related injuries than for a non-fall-related reason³¹.

Sarcopenia also significantly impacts self-reported quality of life and physical activity level^{32,33}. In women from the prospective Study of Osteoporotic Fractures, it has been shown that slowness was associated with greater health care utilization, including greater number of hospitalizations, rate of hospitalization days and likelihood of a short-term skilled nursing facility stay than women without slowness³⁴. Musculoskeletal disorders and their consequences are also associated with increased mortality risk. This has been shown for after low-trauma fractures^{35–37}, in patients with painful osteoarthritis³⁸ or with sarcopenia or deficits in mobility, even after adjustment for confounding factors^{39,40}. This burden is deemed to increase, driven by population aging, and largely exceeds service capacity, leading to a substantial treatment gap, in particular in the context of osteoporosis in which fractures are however preventable^{29,41}.

Assessment of quality of life in musculoskeletal disorders

Health-Related Quality of Life (HRQoL) is considered to be a subjective assessment of the impact of disease and treatment across physical, psychological, social and somatic domains of functioning and well-being⁴². This is also one of the most important concept in all medical illnesses that involves all relevant factors to health status directly and indirectly. HRQoL is also an important measure of a patient's perception of his/her illness. Measurement of HRQoL has become increasingly important in research and clinic over the past three decades. Randomised controlled trials as well as observational studies increasingly include QoL measures, usually as a secondary endpoint. Moreover, many medical interventions are now designed to improve quality of life rather than prolong the life. Additionally, there are studies utilizing measures of QoL as predictors, for example of physical decline or death^{43,44}. Inclusion of QoL measures into studies is no longer restricted to highly developed western countries, but now includes countries from all over the world^{45,46}.

Research published clinical practice guidelines recommending providers to routinely evaluate patients' HRQoL and use their assessment to modify and guide patient care⁴⁷. Two main approaches, namely generic and disease-specific instruments, can be applied to measure HRQoL⁴⁸.

1.1 Generic tools to assess quality of life in musculoskeletal health

Generic HR-QoL instruments are designed to be applicable across a wide range of populations and interventions. Indeed, these simple and effective instruments⁴⁹ are designed to focus on domains of quality of life that can be expected to be affected by health-care interventions. They are therefore widely used in observational studies and clinical studies since they allow comparison between, for example, different populations suffering from a

same disease or comparison of the quality of life impact of the disease based on the state of the disease.

Among the generic tools available in scientific literature, the short form 36 questionnaire (SF-36) and the Euroqol five item questionnaire (EQ-5D) are two of the most popular questionnaires used to quantify the health related quality of life in people with musculoskeletal disorders. The SF-36 questionnaire⁵⁰ is composed of 36 items measuring 8 health-related quality of health domains (physical functioning, role limitation due to physical problems, bodily pain, general health, vitality, social functioning, role limitation due to emotional problem, and mental health). The EQ-5D questionnaire is also a generic tool⁵¹, which records the level of self-reported problems according to five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression).

Studies employing the SF-36 have been undertaken in patients presenting various musculoskeletal disorders such as chronic back disorders^{52–54}, arthritis^{55–57}, osteoarthritis⁵⁸, rheumatoid arthritis⁵⁹, spinal problems^{60,61}, fibromyalgia^{62,63} but also sarcopenia^{64–66}. The EQ-5D has also been used for disorders such as back disorders^{67,68}, osteoarthritis of the knee⁶⁹, rheumatoid arthritis^{70,71}, sarcopenia^{64,72} and several musculoskeletal diseases⁷³.

A study including 3664 participants assessed the prevalence of twelve common musculoskeletal disorders⁷⁴. Results reported that subjects with musculoskeletal diseases (n=1776) had a worst quality of life compared to those without any musculoskeletal conditions (n=1888). Lower scores were found for all SF-36 dimensions. The worsted results were found for fibromyalgia, osteoporosis of the hip, osteoporosis and rheumatoid arthritis, one again across all domains of the SF-36 questionnaire. Subjects with a musculoskeletal disease were also reported more health problems on the EQ-5D dimensions than those without a musculoskeletal disease. Subjects suffering from a musculoskeletal diseases presented therefore more problems on mobility (29.9% versus 10.5%), self-care (6.6% versus 2.3%), usual activities (34.5% versus 12.4%), pain/discomfort (62.5% versus 31.2%) and, finally, anxiety/depression (23.3% versus 14.8%).

One of the major criticisms highlighted against the use of generic quality of life questionnaire is that these instruments, designed to measure HRQoL over a broad spectrum of diseases, may not be sensitive enough to detect HRQoL specific to a particular illness of interest. Indeed, they are often based on a relatively narrow focus on the concept of health and therefore, they address only a selective number of domains. Moreover, they carry the risk of being insensitive to changes over time or treatment. In some specific musculoskeletal condition, such as sarcopenia for example, it is acknowledged that generic tools should be supplemented with disease-specific instruments⁷⁵.

1.2 Specific tools to assess quality of life in musculoskeletal health

Because generic tools may not always be able to detect subtle effects of a specific condition on QoL, a specific tool is highly valuable to assess the impact of musculoskeletal conditions on QoL. A large number of disease specific tools already exist in the field of musculoskeletal health. In the field of osteoporosis, for example, no less than 6 specific

health-related quality of life tools are available (Qualeffo-4148,76, questionnaire QoL in Osteoporosis [QUALIOST]77, osteoporosis assessment questionnaire [OPAQ]78, osteoporosis QoL questionnaire [OQLQ]79, osteoporosis functional disability questionnaire [OFDQ]80 and osteoporosis-targeted QoL questionnaire [OPTQoL]81). Specific quality of life questionnaires are also available for other conditions, such as arthritis in general (e.g. WOMAC, rheumatoid arthritis quality of life [RAQoL]82) but also for some specific form of arthritis such as knee and hip arthritises (osteoarthritis knee and hip quality of life questionnaire [OAKHQOL]83) or psoriatic arthritis (PsAQoL questionnaire84). Other specific quality of life questionnaires have also been found for sarcopenia (sarcopenia & quality of life questionnaire [SarQoL]85) and fibromyalgia (fibromyalgia impact questionnaire and its revised version [FIQ]86).

Specific tools improve the ability to clinically characterize QoL in subjects with a specific musculoskeletal disorder, as well as the capacity to assess changes over time in the QoL of these subjects. Even if therapeutic interventions in the field of sarcopenia and frailty are still in their infancy87,88, these tools can be used to assess the relevance of interventions and their effectiveness in terms of change in quality of life. The disadvantage of specific tools is that they do not offer the possibility to compare quality of life of subjects with other types of population.

Conclusion

Musculoskeletal disorders are major health conditions associated with ageing, which affect morbidity, quality of life and mortality, and contribute to increase healthcare costs for the society. In the context of population ageing, of improvement of life expectancy and of the consensual previsions of marked increase of the proportion of older people, they represent a great challenge to limit their current and future economic and societal burden. Improvement of quality of life should be the priority of any interventions to prevent and treat osteoporosis, osteoarthritis and sarcopenia in the ageing population. The recent development of tools dedicated to the assessment of QOL related to musculoskeletal conditions should help to validate such interventions.

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