

Quality of life assessments with SF 36 in different musculoskeletal diseases

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Abstract The aim of this study is to evaluate comparatively the life quality of patients with knee osteoarthritis (KO), shoulder impingement syndrome (SIS), fibromyalgia (FM), or osteoporosis (OP) using SF 36 and establish the impact of these diseases on quality of life (QoL). A total of 193 patients with one of the above-mentioned different diagnoses completed SF 36 scale. The diseases were compared to each other with SF 36 subgroups scores. There were significant differences among patients with KO and SIS, SIS and FM with respect to all SF 36 subgroups scores. According to these assessments, QoL of KO and FM patients was worst than that of SIS. The QoL scores of KO patients were worse than those of FM patients considering the physical function, while QoL scores of FM patients were lower than those of KO patients with respect to their general well-being. Scores of physical function and pain in KO patients were lower than those of OP patients. In domains of social functioning, emotional role, energy, pain, and general health condition QoL of FM patients was worse than that of OP patients. Quality of life of SIS patients was less affected than the patients of the other disease groups. In spite of their young age, FM patients appear to be the group with the worst quality of life scores.

Keywords Musculoskeletal disorders · Quality of life · SF-36

Introduction

Diseases affecting musculoskeletal system cause alterations in general well being and influence quality of life of the individual adversely. Among these diseases, knee osteoarthritis (KO) is the most frequently seen condition leading to severe restrictions in daily activities and thus impairing quality of life [1]. Shoulder impingement syndrome (SIS) is also a musculoskeletal disorder resulting in functional disability and significant decrease in the quality of life [2]. Osteoporosis (OP) with its most valid current definition is characterized by lower bone mass, deterioration in bone microarchitecture, and related bone fragility resulting mostly in increase of vertebra, wrist, and hip fractures [3]. However, this definition is inadequate in providing detailed information on the impact of osteoporotic fractures on the quality of life of individuals. As osteoporosis is a functional abnormality and an important clinical syndrome leading to many problems with respect to quality of life, it should not be defined solely on the basis of bone mass loss. Fibromyalgia (FM) is a syndrome of unknown etiology characterized with widespread bodily pains, fatigue, sleep disorders, and tender foci on various regions of the body [4]. Its significant deteriorating effects on the quality of life are already acknowledged. In fact, in all the diseases mentioned, the quality of life worsens. In many investigations performed using the Overall Quality of Life Scale (SF 36), evidence related to decrease in quality of life in various diseases have been revealed [5–8]. SF 36 is the most widely used criteria among generic scales. It is a valid scale employed with a relatively higher frequency. It is not specific for a certain age group, disease category, or a therapeutical modality. It encompasses general health concepts. The SF 36 consists of 36 items that are employed to calculate scores on eight dimensions: physical function-

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ing, role limitation due to physical health problems, bodily pain, general health, vitality, social functioning, role limitation due to emotional health problems, and mental health. Scores had a range between 0 and 100, with a higher score indicating a better health-related quality of life. It has two summary scales as Physical Component Scale (physical functioning, physical role, bodily pain, and general health) and Mental Component Scale (vitality, social functioning, emotional role, and mental health) [9–11]. SF 36 was translated into Turkish and validation studies of Turkish version of SF 36 were carried out in patient groups in 1999 and 2005 [12, 13]. However, studies demonstrating the relative impact of diseases on the quality of life are few in number [14]. As the above-mentioned diseases were the most frequently encountered disorders in our out-patient clinics, our aim was to determine the state of disease mostly influential on the quality of life status using SF 36 Quality of Life Scale.

Materials and methods

A total of 193 patients referred to Physical Therapy and Rehabilitation Polyclinic of Sisli Etfal Education and Research Hospital with diagnoses of KO, SIS, OP, and FM were required to fill a SF 36 form. As these musculoskeletal disorders affect different bodily regions and seen in diverse age groups with the highest incidence among our outpatient clinics, it is logical to select these four diseases. For KO, diagnostic criteria of American College of Rheumatology (ACR) [15], for FM 1990 ACR criteria [16], for OP criteria of World Health Organization [17] were used. Classical impingement tests performed with subacromial injections of 10 ml 1% lidocaine were employed to establish diagnosis of SIS, and the diagnosis was confirmed with magnetic resonance imaging (MRI) findings [18]. OP patients were chosen among those whose menstrual periods ceased at least 5 years ago and had not received antiresorptive treatment beforehand. Those with tumoral, infectious, neurological, and cardiovascular diseases were excluded from the study. Every disorder was compared with each other as for subgroups of SF 36 scale.

Statistical analyses were performed using GraphPad Prisma V.3 package software program.

For the evaluation of data, intergroup, and subgroup comparisons, descriptive statistical methods (means, standard deviation), one-way analysis of variance (ANOVA), and Tukey multivariate comparison tests were used, respectively. Homogeneity of variance and even distribution of scores necessitated statistical analyses with parametric tests. The results were considered significant at $p < 0.05$.

Results

Forty-seven KO, 40 SIS, 60 FM vs 46 OP patients were investigated. Demographical characteristics of the patients are given in Table 1. Mean ages of the patients were 55.77 ± 7.92 , 56.93 ± 9.24 , 41.08 ± 9.49 , and 63.15 ± 9.51 years, respectively. Durations of disorders for KO [40.25 ± 54.78 (3–120 months)], FM [48.38 ± 32.79 (4–60 months)], and SIS (7.08 ± 5.89 (3–24 months)) were also assessed. KO group consisted of 14 male and 33 female patients, while SIS group had 11 male and 29 female patients. However, FM and OP groups were comprised of female patients. When any gender difference in quality of life scores was assessed, female patients demonstrated significantly lower Vitality subscores in KO and worse Physical Function subscores in SIS groups ($p < 0.05$). Not a significant difference was seen among other subgroups. Re-examination of medical files of 10 OP patients revealed one vertebral fracture in each case. When SF 36 scores of patients with or without fractures were evaluated, no significant difference was noted between these two groups (Table 2). During evaluation process, all patients experienced pain. As OP patients were included in the study as soon as their diagnoses were established, duration of disease in the OP group could not be determined. However, if we consider that their postmenopausal OP cases were included in the study, the suggestion that the patients might have OP for at least 3–4 years would not be misleading. While the difference between mean ages of patients in KO and SIS groups was not significant, cases with FM were significantly younger than those of the remaining three groups. On the contrary OP, patients were comparatively older than the patients in the

Table 1 Demographic characteristics of the patients

	Knee osteoarthritis	Shoulder impingement syndrome	Fibromyalgia	Osteoporosis	F	Sig.
Age	55.77 ± 7.92^a	56.93 ± 9.24^b	$41.08 \pm 9.49^{a,b,c}$	$63.15 \pm 9.51^{a,b,c}$	57.466	0.0001
Weight	66.89 ± 10.84	65.58 ± 10.95	66.93 ± 11.4	62.85 ± 12.76	1.83	0.143
Height	160.79 ± 7.71	158.65 ± 6.35	159.92 ± 5.51	157.54 ± 5.24	1.67	0.186

^a Knee osteoarthritis /the others

^b Shoulder impingement syndrome/ the others

^c Fibromyalgia/ the other

Table 2 SF-36 subgroup scores of OP patients with or without fractures

	Fracture	N	Mean	<i>t</i>	<i>p</i> value
Physical function	(-)	36	60.69±24.35	1.22	0.229
	(+)	10	50±25.06		
Social function	(-)	36	61.11±23.38	-0.13	0.897
	(+)	10	62.22±25.77		
Role physical	(-)	36	43.06±40.36	1.47	0.149
	(+)	10	22.5±34.26		
Role emotional	(-)	36	55.56±37.37	0.93	0.36
	(+)	10	43.33±35.31		
Mental health	(-)	36	60.22±20.86	0.54	0.589
	(+)	10	55.6±32.74		
Vitality	(-)	36	48.61±22.79	1.32	0.195
	(+)	10	38±21.63		
Pain	(-)	36	51.23±22.11	1.13	0.266
	(+)	10	42.22±23.31		
General health	(-)	36	52.5±21.99	0.81	0.424
	(+)	10	45.5±31.57		

other three groups (Table 3). In all patient groups, significant differences existed as for SF 36 subgroup scores and total scores (Table 4). When SF 36 subgroup scores were analyzed, only physical functioning was the worst in KO; apart from these, FM had the poorest score among all other subgroups. Therefore, the worst total SF 36 score was found in FM. However, SIS had significantly higher scores in all subgroups when compared with the other disorders. When we looked upon dual comparisons of disorders (Table 5), a significant difference between SIS and OP with respect to emotional role scores did not exist, but SIS had significantly higher subscores relative to the remaining three conditions. When FM, which had the worst scores, was compared with KO, physical functioning subgroup scores were worse in KO. Scores related to general health status were lower in FM. A significant difference was not found between FM and OP as for subgroup scores related to physical functioning, physical role, and mental health. For all other subgroup scores, FM patients had demonstrated significantly lower values. In the comparison between OP and KO, both physical functioning and bodily pain scores were detected lower in patients with KO, while a significant difference

among the remaining subgroup and total scores was not revealed.

Discussion

Quality of life comprises all areas of life as health status, environmental, financial conditions, and human rights. Health-related quality of life is a subgroup encompassing physical, emotional, and social aspects of quality of life [19].

Quality of life is an important indicator of disabilities prevailing in musculoskeletal disorders [20]. In a study conducted by Roux et al. [21] using SF 36 quality of life scale, quality of life deteriorated significantly in acute musculoskeletal system diseases especially with respect to physical subgroup scores, while social functioning and mental health were affected at a lesser scale. Ethgen et al. [22] indicated that psychosocial aspects of quality of life in chronic diseases were fairly altered. Our disease groups should be considered as chronic diseases. Average duration of pain in KO and FM groups lasted at least 3 months and at most 3 years. Although duration of disease in SIS group was relatively shorter than that of KO and FM, still it belonged to the chronic disease category. In our disease groups, subdivisions of bodily pain and emotional role were impaired more deeply than the other subgroups. In a study conducted by Picavet et al., where 12 different musculoskeletal system diseases [discal hernia, gout, repetitive strain injury, epicondylitis, knee osteoarthritis, hip osteoarthritis, osteoporosis, whiplash, rheumatoid arthritis (RA), other chronicarthritis, FM, tendonitis, and capsulitis] were analyzed, it was indicated that individuals with primarily musculoskeletal system diseases had more deteriorated quality of life scores when compared with general population, and they also detected that the worst physical functioning and bodily pain scores were in knee and hip osteoarthritis, RA, osteoporosis, and FM [14]. Ethgen et al. [23] indicated that health interventions in osteoarthritis primary dedicated to pain and physical disability. In our study, the lowest scores in physical functioning and pain subgroups belonged to FM and KO groups, respectively. In a study where patients with FM and RA were compared

Table 3 Differences in ages of patients in disease groups

	Age
Knee osteoarthritis/shoulder impingement syndrome	0.934
Knee osteoarthritis/fibromyalgia	0.0001
Knee osteoarthritis/osteoporosis	0.001
Shoulder impingement syndrome/fibromyalgia	0.0001
Shoulder impingement syndrome/osteoporosis	0.008
Fibromyalgia/osteoporosis	0.0001

Table 4 SF-36 quality of life scores in various disease groups

	Knee osteoarthritis	Shoulder impingement syndrome	Fibromyalgia	Osteoporosis	<i>F</i>	Sig.
Physical function	40.43±22.84 ^a	83.38±16.5 ^{a,b}	57±20.36 ^{a,b}	58.37±24.63 ^{a,b}	29.342	0.0001
Social function	52.48±22.78 ^a	84.44±7.88 ^{a,b}	46.48±25.43 ^{b,c}	61.35±23.63 ^{b,c}	26.396	0.0001
Role Physical	30.85±42.74 ^a	98.75±5.52 ^{a,b}	28.33±38.36 ^b	38.59±39.69 ^b	37.175	0.0001
Role emotional	35.46±39.57 ^a	67.5±5.27 ^{a,b}	28.33±39.21 ^{b,c}	52.9±36.9 ^{b,c}	12.283	0.0001
Mental health	53.19±22.93 ^a	78.4±12.38 ^{a,b}	50±21.69 ^b	59.22±23.59	16.324	0.0001
Vitality	47.45±21.82 ^a	76.38±13.63 ^{a,b}	35.25±21.34 ^{b,c}	46.3±22.74 ^{b,c}	33.166	0.0001
Pain	37.59±19.18 ^a	80.56±13.72 ^{a,b}	36.67±18.56 ^{b,c}	49.28±22.43 ^{a,b,c}	51.62	0.0001
General Health	48.83±20.78 ^a	76±16.88 ^{a,b}	33.25±19.11 ^{a,b,c}	50.98±24.17 ^{b,c}	35.164	0.0001

^a Knee osteoarthritis/the others^b Shoulder impingement syndrome/the others^c Fibromyalgia/the other

with healthy controls using SF 36 scale, quality of life scores in both diseases were found to be significantly lower than those of controls, while mental health in FM group was more deeply affected than that of RA [24]. RA patients were not included in our study group. However, in the group we analyzed, the lowest subgroup scores were found in mental health, emotional role, and vitality scores of FM disease. In a study conducted by Ataoglu et al. [25], patients with FM, KO, and RA were evaluated with SF 36 scales. While physical functions of FM patients were observedly better than KO, in all other items of SF 36 scale, lower quality of life scores were detected in FM. In our study, apart from physical functioning items, patients with FM had lower scores than those with KO.

In a multicentered study conducted by Hopman et al., quality of life of Canadian population was analyzed in 9,432 individuals, ages of the study population were stratified into decades from 25 years of age on, and their related SF 36 scores were assessed. As for this study, general health status, bodily pain, physical role, and physical functioning items deteriorated with age. In mental health status, such a progression to a worsening outcome is not valid. Increases in scores up to 75 years of age were noted in vitality and social functioning domains; however, these scores fell down starting from 75 years of age [26]. Within an overall context, it is not wrong to say that quality of life will worsen as years go by. However, this adverse

trend is conspicuous rather in bodily pain, physical functioning, and general health items. In our study, FM group had the youngest patients with the lowest quality of life scores. On the contrary, OP patients were the oldest subjects with better quality of life scores compared with KO and FM patients. All subgroup scores of SF 36 scale excluding those related to physical function were lower relative to OP group. In this case, we conceive that age is not a very important factor in the assessment of quality of life, and it is possible to state that especially psychological status plays a significant role in the evaluation of patient's quality of life.

In our study, we aimed to reveal the extent and different degrees of impact of KO, SIS, OP, and FM on the quality of life. In our study, quality of life scores of KO and FM patients were much impaired in all SF 36 items when compared with those with SIS. KO group demonstrated lower scores in physical functioning scale than FM group, while as for general health scale, FM patients were in a worse condition than KO patients. From this observation, one can deduct that KO leads to more severe functional disability possibly due to pains involving knee joints, which are used more often in daily living activities. It has been understood that FM patients usually feel themselves more desperate although they do not have comparatively lower physical functioning scores. Therefore, for being healthy, normality of physical functioning is not adequate, and

Table 5 (Mutual) comparisons of quality of life scores of diseases

	Physical function	Social function	Role physical	Role emotional	Mental health	Vitality	Pain	General health
KO/SIS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
KO/FM	0.0001	0.49	0.984	0.714	0.863	0.012	0.994	0.001
KO/OP	0.0001	0.201	0.726	0.07	0.508	0.993	0.015	0.957
SIS/FM	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
SIS/OP	0.0001	0.0001	0.0001	0.204	0.0001	0.0001	0.0001	0.0001
FM/OP	0.988	0.003	0.462	0.002	0.111	0.03	0.004	0.0001

KO Knee osteoarthritis, SIS shoulder impingement syndrome, FM Fibromyalgia, OP osteoporosis

many factors including mental health are considered to influence general well being. In addition, the detection of more impaired quality of life scores in FM group, despite comparatively younger patient population, has indicated that age factor is not the only culprit in poorer quality of life of these patients. Similarly, OP patients are older than KO patients, but KO patients had worse scores for physical functioning and bodily pain items providing support in favor of this point of view.

Classically, the OP is painless. The complications of the OP, that is, bone fractures, cause a well-known acute symptomatology. Subsequent chronic pain is the consequence of skeletal deformities, joint incongruences, and tensions on musculo-tendineous structures [27]. Generally, OP does not cause pain in patients without fractures. Pain predominates in cases with osteoporotic fractures. Thus, it is thought that quality of life of osteoporotic patients with fractures might be affected more deeply. Hallberg et al. [28] indicated that the quality of life of osteoporotic patients as assessed with SF 36 scale was worse than those with normal bone mineral densities, and this impairment in quality of life scores of patients with hip and vertebra fractures persisted longer when compared with cases with forearm and vertebra fractures. In a study performed by Lombardi et al., osteoporotic patients with or without fractures were compared with healthy control subjects, and pulmonary functions of fracture patients were found to be more impaired than those of osteoporotic patients without fractures. However, any difference among quality of life scores of three groups was not revealed [29]. In another study we conducted, quality of life scores of patients with osteopenia and osteoporosis and those with or without vertebral fractures were compared, and no difference among these patient groups as for quality of life scores was detected [30]. In this study, where four diseases are compared, OP effects life quality less severely than FM and KO. It may be argued that osteoporotic patient group was not stratified according to the presence of vertebral fractures. As literature investigating the effect of vertebral fracture on quality of life is equivocal among osteoporotic patients, we do not think that our study is limited in this respect. In our subsequent analyses, we classified OP patients as those with or without fractures and found one vertebra fracture in each OP patient. However, when SF 36 scores of OP patients with or without fractures were compared, we did not observe a significant difference between two groups. The reason why quality of life scores of OP patients were better than those of FM and KO might be explained by the lower incidence of fractures in OP patients.

Some studies using SF 36 scales have shown that SIS decreases quality of life significantly [31, 32]. In our study group, SF 36 quality of life scores of SIS patients were

significantly higher than those of the other disease groups. It means that their quality of life scores were impaired less when compared with the other disease groups. It has been demonstrated that SF 36 could be used in the evaluation of quality of life scores in shoulder abnormalities [33]. As FM and OP are systemic diseases causing more widespread bodily pains, they might lead to lower scores than those of SIS. In comparison between locally painful conditions as SIS and KO, the reason for lower scores obtained in KO can be attributed to difficulty in both locomotion due to locally painful lower extremity joint(s) and performance of daily activities and their adverse impact on the quality of life.

In this case, among four different musculoskeletal system diseases included in our study, SIS group appears to influence the quality of life minimally. FM patients have the comparatively lowest scores in all subgroups excluding physical functioning. FM group has the worst quality of life scores. Besides KO demonstrated lower physical functioning scores compared with the remaining three groups. However, when overall SF 36 score was taken into consideration, KO group was apparently affected worse than the FM group. OP patients had lower quality of life scores than those with SIS.

Therefore, among our disease groups, the quality of life appears to be influenced minimally by SIS and mostly by FM. It is noteworthy that KO affected general health status more than OP. From these observations, it is conceived that age per se is not the most important factor in the quality of life, instead emotional status, the presence of local or systemic condition, and the impact of limited joint motion should also be considered to be significant contributing factors.

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