

ORIGINAL RESEARCH ARTICLE

Impact of Osteoarthritis of Knee on Quality of Life of an Individual.

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Abstract:

Background: Osteoarthritis (OA) is a degenerative disease that frequently leads to pain and disability. With aging of our population this condition is becoming increasing prevalent. Quality of life is associated with pain, functional limitation and depressed mood, therefore need to be studied.

Methods: 100 participants with unilateral knee OA (either patellofemoral or tibiofemoral) were included in the study. The duration of symptom of knee pain ranged from 2 months to 10 years. SF-36 was administered, that measures health related quality of life. The data obtained from participants using SF-36 were electronically scored via internet scoring software.

Results: 100 participants with unilateral knee OA (either patellofemoral or tibiofemoral) were included in the study. The duration of symptom of knee pain ranged from 2 months to 10 years. SF-36 was administered, that measures health related quality of life. The data obtained from participants using SF-36 were electronically scored via internet scoring software.

Conclusion: Knee OA has relatively poor quality of life pertaining to the physical and mental health components. Older adults with OA of the knee and pain intensity undergo a significant impact on multiple dimensions of health related quality of life (HRQOL). Gender and duration of symptoms does not affect the most of the QoL domains in such population.

Keywords: knee pain, duration of symptoms, health related quality of life.

Introduction:

Many people use the word arthritis without knowing the meaning arthritis is really not a single disease. There are over 100 different kinds of arthritis all of which affect one or more joints in the body. The word arthritis come from two Greek words 'Arth' meaning "Joint" & 'itis' means "inflammation". Thus arthritis is inflammation of a joint which is somewhat misleading because in any kind of arthritis the joint is not inflamed or swollen. The pain however may be nagging or at its worst, it can be physically and mentally crippling [1]. OA is a degenerative disease that frequently leads to chronic pain and disability. With the aging of our population, this condition is becoming increasing

prevalent and its treatment increasingly financially burdensome. Currently, only the symptoms of OA can be treated; there is no cure [2].

In OA the cartilage gets thinned out just like the tyres of a car wear out with time and use. At first there is pain later the bone ends may actually rub against each other, causing stiffness. In severe cases, the bone ends become roughened and movement becomes difficult.

The prevalence of osteoarthritis in India is very high. It is widespread in middle to older aged people. Osteoarthritis may first appear without symptoms between 20 and 30 years of age. The symptoms, such as pain and inflammation, become visible in middle age.

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Till the age of 55 it occurs equally in both sexes. But after 55, women are more prone to this disease. Many studies have demonstrated that age is not a foremost factor to the start of Osteoarthritis. Many medical professionals have found that overweight may be the reason of having this disease. When a person is obese, there are more chances of experiencing some pain in the knees and in most cases; osteoarthritis develops in these areas. It is predictable that approximately four out of 100 people are affected with this disease [3].

To reduce the impact of arthritis, the key is early diagnosis. Its diagnosis based on the pattern of symptoms, medical history, physical examination, some tests and x-rays. Typical symptoms include pain after walking which may later occur even at rest, creaking sounds in the joint, difficulty in getting up from a chair, and pain on walking up and down stairs [2].

In these individuals, quality of life is associated with pain, functional limitations, and depressed mood. It is important to identify these problems when caring for older adults, and special attention should be given to individuals with osteoarthritis because of their higher degree of pain and functional limitations [4].

QOL may be defined as subjective well-being. Recognizing the subjectivity of QOL is a key to understanding this construct. QOL reflects the difference, the gap, between the hopes and expectations of a person and their present experience. Human adaptation is such that life expectations are usually adjusted so as to lie within the realm of what the individual perceives to be possible. This enables people who have difficult life circumstances to maintain a reasonable QOL [5, 6]. Many QOL studies are available showing the reduced QOL due to disease process. There is very few literature available suggesting reduced QOL in knee OA individuals and their association with age and duration of symptoms. SF 36 v2 is one of the valid, reliable scale for assessing QoL in individuals with various diseases such as OA, bronchial asthma, RA, Diabetes. Here in the present study, an attempt is done to evaluate the QOL using SF 36- v2 in knee OA patients. Osteoarthritis of the knee is predominately considered a "wear and tear" process, where there is gradual degradation of the hyaline cartilage that covers the articulating surfaces of the bones in the knee joint. In most people, the disease is either post-traumatic or hereditary. [9] Osteoarthritis is characterized by breakdown of the joint cartilage, joint space narrowing, thickening of the underlying subchondral bone, and osteophyte formation. The pain in osteoarthritis arises from cartilage erosion; without the protective cartilage cushion in a joint, the joint space narrows and bones rub against each other. Cartilage remodeling involves balanced interactions of synthesis and degradation to achieve homeostasis of the extracellular matrix (ECM). [10]

Material & Methodology:

Study design: Descriptive, Correlational study with Selective sampling.

Study Setting: In a present study, hundred (59 males and 41 Females) out patients of either sex, aged above 50 years with Chronic non specific unilateral knee pain included in the study. The duration of symptoms of knee pain ranged from 2 months to 10 years. Prior to participation, subjects signed a consent form that was approved by institutional review boards.

Instrumentation:

Health-related QOL for participants was measured using SF-36. SF-36 includes eight individual sub-scales (physical function, physical role, emotional role, social function, bodily pain, mental health, vitality and general health perceptions and two summary scores (Physical and Mental summary score/Component score). A higher SF-36 score indicates better functioning [11, 12].

- After identifying eligible individuals, the Short Form 36 (SF-36) was administered by self-administration or face-to-face interviews (for illiterate persons) which measures health-related QOL.
- Data obtained from participants using SF-36 were electronically scored via the instrument-scoring software available at www.sf-36.com (Scoring for version 2 of the SF-36 is based on the algorithms).

Inclusion criteria:

Both Male and Female subjects with age > 50 years were included in the study. Medically diagnosed cases of Grade I and II unilateral Osteoarthritis by an orthopedician or the subjects fulfilling the *American College of Rheumatology criteria*.

Knee pain during at least one of the following activities: walking, going up or down stairs, standing upright, or lying in bed at night and at least three of the following 6 criteria:

- 50 years of age or older,
- stiffness lasting less than 30 minutes,
- Crepitus,
- bony tenderness,
- Bony enlargement, no warmth to the touch.
- Radiographic evidence of grade I-II tibiofemoral or patellofemoral OA: defined as the presence of osteophytes in the tibiofemoral compartment and /or the patellofemoral compartment, as assessed on standing anterior/posterior and lateral views.[13,14,15]

Exclusion Criteria:

Patients having BMI of >39 kg/m² were excluded. Subjects with cardiac pacemakers, known cardiac arrhythmias, thrombophlebitis or thrombosis, malignant tumors, open wounds, or in those with impaired sensation, cognitive function, or communication ability, subjects with immediate vicinity of metallic implants. Any history of trauma,

other condition causing knee pain e.g. Rheumatoid Arthritis, ligament or meniscal injury, patellar bursitis, patellar instability, any previous surgery to lower extremity and any systemic disorder [16,17,18].

Health Related Quality of life: The SF-36 was used to determine HR QoL. The SF-36 is a generic self-report measure which consists of 8 sub-scales; namely PF (*Physical Functioning-10 items*), RP (*Role Physical -4 items*), BP (*Bodily Pain-2 items*), GH (*General Health perceptions-5 items*), V (*Vitality-4 items*), SF (*Social Functioning-2 items*), RE (*Emotional-well being-3 items*), and MH (*Mental Health-5 items*) with two summary measures; Physical Component Score (PCS) and Mental Component Score (MCS). Studies have reported excellent reliability and validity of the SF-36 in various populations including people undergoing

total knee replacement. SF-36 health survey form was filled as narrated by the participant and scores were electronically calculated via the Scoring Software available at www.sf-36.com

The SF-36 is a well known self-administered and generic health status measure which encompasses 8 domains related to daily life activities: physical functioning, role limitations due to physical problems, role limitations due to emotional problems, vitality, bodily pain, social functioning, mental health and general health perception [23,24]. Each domain scores from 0 to 100 (were 0 is the lowest level of functioning and 100 is highest level of functioning). The instrument has been extensively validated within the Medical Outcome Study 24 and in other settings [23].

Result:

Table 1: Sex and age distribution of participants.

	Male	Female	P value (t-test)
No. of Participants	59	41	
Age [in years] Mean ±SD	61.08 ±6.27	62.09±8.97	0.5122 (NS)
Duration Of Symptoms [years] Mean + SD	5.50±4.01	6.04±4.50	0.5345 (NS)

Out of 100 participants, 49 (49%) participants were females and 51(51%) were males. The mean ages of participants was 61.5± 7.0 years, whereas the mean age of male was 61.08 ±6.27 years and female was 62.09±8.97 years this difference was not statistically significant. The mean Duration of Symptoms in male and female was 5.50±4.01 years & 6.04±4.50 years respectively and this difference was not statistically significant.

Table 2: Correlations between age & SF 36 scores

Age(n=100) (Mean ± SD) in years	PF Mean ±SD	RP Mean ±SD	BP Mean ±SD	GH Mean ±SD	VT Mean ±SD	SF Mean ±SD	RE Mean ±SD	MH Mean ±SD
61.5±7.51	33.572 ±4.50	35.81 ±4.66	37.827 ±3.89	42.182 ±5.58	48.164 ±3.9	35.091 ±6.97	28.7 ±5.86	37.502 ±5.90
r value	-0.401	-0.176	-0.083	-0.389	-0.095	-0.186	-0.157	-0.027
P value	0.000 **	0.025*	0.014 *	0.000 **	0.129(NS)	0.002 **	0.006**	0.103 (NS)

** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level (2-tailed).

The 8 sub scales with their means were (PF 33.57 RP 35.81 BP 37.82 GH 42.18 VT 48.16 SF 35.09 RE 28.7 AND MH 37.5). All the 8 Sub scales were negatively correlated with age. PF, RP, BP, GH, SF & RE were found statistically significantly correlated with age and VT, MH were not significantly correlated.

Table 3 : Correlation between duration & sf-36 scores (n=100)

Duration(n=100) MEAN ±SD in years	PF MEAN ±SD	RP MEAN ±SD	BP MEAN ±SD	GH MEAN ±SD	VT MEAN ±SD	SF MEAN ±SD	RE MEAN ±SD	MH MEAN ±SD
25.71±2.63	33.572 ±4.50	35.81 ±4.66	37.827 ±3.89	42.182 ±5.58	48.164 ±3.90	35.091 ±6.97	28.7 ±5.86	37.50 ±5.90
r value	-0.536	-0.223	-0.244	-0.510	-0.153	-0.300	-0.272	-0.164
P value	0.00**	0.079(NS)	0.414(NS)	0.00**	0.345(NS)	0.064(NS)	0.157(NS)	0.079(NS)

** Correlation is significant at the 0.01 level (2-tailed).

All the 8 Sub scales were negatively correlated with age. PF & GH were found statistically significantly correlated with age and RP, BP, VT, SF, RE & MH were not significantly correlated.

Discussion:

In the present study we have randomly selected 100 participants having knee osteoarthritis out of which 59 male subjects and 41 female subjects with mean age of 61.08 and 62.09 years respectively.

The purpose of this descriptive study was to assess the quality of life of individuals with knee OA using SF 36. The SF-36 is a widely used measure of general health status which comprises eight subscales; Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional and Mental Health [25, 26]. Results are compared to established normative values for the general U.S. population and specifically to normative values for people aged 65 and older and gender. Speculatively, their HRQoL was expected to be lower than that of the norm-based reference population which may be due to the participants' age and the ongoing disease process. Results of this study do support research indicating that there is a general decline in all domains of HRQoL. The obtained mean scores of SF-36v2 questionnaire in this study showed a reduction in scores in all the domains i.e. PF, BP, RP, VT, SF, GH and MH compared to normative data obtained in 1998 in US population of respective age groups indicating reduced QoL in all the individuals with knee OA in all aspects [27].

This finding of our study is in favour of the study done by Sutbeyaz ST20 in which they concluded that knee osteoarthritis (OA) reduces exercise ambulatory capacity and impairs quality of life (QOL) in obese individuals using medical outcomes of SF-36. Also the study done on Hong Kong Chinese population to measure the impact of osteoarthritis (OA) on quality of life using WOMAC and SF 36 health survey demonstrated that the patients with severe disease had lower mean scores in all SF-36 domains and higher mean scores in all WOMAC domains, indicating poorer quality of life [18].

When comparisons were made based on gender, there was not always a decline in HRQoL. This was confirmed by comparing all the domains of SF 36v2 scores among males and females with OA knee using unpaired t test. The results of this study demonstrated a statistically non significant difference between both the genders (P value = > 0.05) except SF domain. Also, the SF-36v2 scores of males and females were found to be reduced compared to the norms of US population at 50% percentile [27]. This explains that gender does not affect the QoL directly in osteoarthritis patients. But this finding of this study is in contradiction with the study done by Woo J, Lau E, Lee P, Kwok T concluded that women with OA had poorer scores compared to men for bodily pain, general health, and mental health after adjusting for age and disease severity [18]. Additionally, literature stated by Walters S J suggests that women tend to report a lower HRQoL than men [28].

Further, in the present study to evaluate the relation between age, duration of symptoms and pain scores

on VAS with SF-36 scores, Pearson's correlation tests were carried out. The statistical analysis showed a significant negative correlation exists between age and all SF-36 domains. This confirms the relation between age and QoL and can be concluded that as age advances the QoL is more compromised in knee OA patients. This finding is supported by a study by Farquhar, who found that the very elderly (over age 85) living in urban areas were likely to define their QoL negatively, while elderly living in more rural areas used more positive terms [29]. It is also supported by Italian study done by Roy Davis Altman, MD in older patients (mean age, 64.6 years), individuals with OA were compared with healthy matched controls. The authors found significant differences across all 8 QOL SF-36 domains ($P < .0001$ for all 8 domains). The most dramatic losses in QOL were in physical function, role limitations because of physical problems, and pain; mental health and social function were also reduced in patients with OA. 30

Additionally the results revealed a non-significant correlation between duration of symptoms of OA knee in all SF-36 domains except PF and GH. This demonstrates that the duration of symptoms affects only the physical functioning and general health domains of the individual having knee OA. This is supported by a study done by Zakaria ZF, Bakar AA in 2001 to find out the effect of knee OA on QoL using the Short Form-36 (SF-36) questionnaire. The mean duration of knee pain was 4.07 +/- 2.96 years. The physical health status showed lower score as compared to mental health component [15] i.e. duration of pain can reduce the physical functioning of the individual having knee OA.

Furthermore, the present study analyzed the correlation between the VAS scores and the SF-36 domains scores which concluded the statistically significant negative correlation except RP, VT, GH and RE. This explains the intensity of pain strongly affects the most of the SF 36 health domains of QoL in individuals with OA knee. This is supported by a literature given by Roy Davis Altman, MD which states that intensity of pain itself is associated with reduced function among patients with OA [31]. Outcome is influenced by emotions, as patients with OA and psychological distress prior to knee arthroplasty have been shown to experience greater pain and functional impairment postoperatively compared with patients not experiencing such distress in the preoperative period [32].

Additionally this finding is in favor of the literature given by S.C. O REILLY, et al which states that subjects with knee pain have lowered perceived health status overall. Although this is most marked for dimensions related to pain and physical functioning and vitality are also affected. Knee pain is common and is associated with impaired physical function and low perceived health status [33, 34].

As per the discussion till now it can be concluded that there is strong impact of disease process on Quality of

life of an individual suffering from osteoarthritis of knee. Such information provides an opportunity to both target disease prevention as well as to define therapeutic approaches to decrease disease morbidity. Meaningful therapeutic responses are more effectively delineated when based on reproducible functional QOL measures.

Conclusion:

This study has shown that patients with knee OA have relatively poor quality of life pertaining to the physical and mental health components. Older adults with OA of the knee and pain intensity undergo a significant impact on multiple dimensions of HRQOL. Gender and duration of symptoms does not affect the most of the QoL domains in such population.

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