Original Article

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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1055_22

Quality of life and self-reported disability in patients with osteoarthritis: Cross-sectional descriptive study

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Abstract:

BACKGROUND: Osteoarthritis (OA) is a chronic disease in which the cartilage in the joints deteriorates and the bones rub against each other, causing pain, stiffness, and restricted range of motion. This is an age-related condition that affects initially isolated joints or joints on one aspect of the body. The aim of the study is to identify quality of life and self-reported disability in patients with osteoarthritis.

MATERIALS AND METHODS: A cross-sectional descriptive study was conducted in Orthopedic O.P.D. of tertiary care hospital. Study was conducted on 150 samples with convenience sampling at orthopedic O.P.D. Data were collected with standardized tools SF-36 with domains physical functioning (PF), role physical (RP), vitality (VT), mental health (MH), role emotional (RE), social functioning (SF), bodily pain (BP) general health (GH), and Western Ontario and McMaster Universities Arthritis Index (WOMAC) questionnaires with domains pain, stiffness, and functional disability. Descriptive statistics and inferential statistics were used for data analysis such as mean, frequency, percentage, standard deviation, and Chi-square test.

RESULTS: Out of 150 samples, 103 were females, 114 were Hindu, and 131 were married. Highest mean score in RE domain of SF-36 was 60 with SD 38.43 indicating that patients had low impact on quality of life, whereas lowest mean score was 35.33 with SD 32.67 indicating that patients had severe impact in RP domain. In WOMAC index, patients had highest pain in climbing stairs, stiffness during morning, and functional difficulty during doing heavy domestic work, whereas lowest pain in resting, stiffness in evening, and functional difficulty during lying in bed.

CONCLUSION: Patients with OA had poorer quality of life in domains PF, RP, VT, BP, and GH. Patients with osteoarthritis showed highest self-reported disability in terms of pain in climbing stairs, stiffness during morning, and functional difficulties in doing heavy domestic duties.

Keywords:

Cartilage, mental health, osteoarthritis, quality of life, range of motion

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Received: 24-07-2022
Accepted: 19-09-2022
Published: 31-03-2023

Introduction

Osteoarthritis is a chronic disease in which the cartilage in the joints deteriorates and the bones rub against each other, causing pain, stiffness, and restricted movement. This is an age-related condition that affects initially isolated joints or joints on one aspect of the body. It usually does not create any warmth or redness in the joints any longer. Osteoarthritis (OA) most commonly affects weight-bearing joints or overworked joints such as the knees and hips.[1]

Osteoarthritis is a slowly progressive, noninflammatory disease of the synovial joint, sometimes called as "wear and tear arthritis." Once the smooth cushion between

How to cite this article: Kumar T, Pandey V, Kumar A, Elhence A, Choudhary V. Quality of life and self-reported disability in patients with osteoarthritis: Cross-sectional descriptive study. J Edu Health Promot 2023;12:81.

the bones (cartilage) deteriorates, the joints can become stiff, painful, and swollen. Any joints can be affected by osteoarthritis, but most commonly it occurs in the knees and hips. This disease begins slowly and worsens over time. Osteoarthritis can occur at any age but often begins in the 50s and affects females more as compared to males.[2] People who are suffering from osteoarthritis will have morning stiffness in their affected joints.[1] Many techniques are available to manage osteoarthritis, prevent and minimize pain, and keep mobile. Some people are never affected by osteoarthritis.[2]

Osteoarthritis is the most common type of arthritis and one of the most disabling diseases.[3,4] It is a chronic and progressive condition that causes stiffness, joint pain, and disability. The major risk factors for osteoarthritis in weight-bearing joints such as the knees and hips have been identified as age, obesity, and joint damage.[5] Although the exact cause of osteoarthritis is unknown. Knee osteoarthritis is a significant burden on both individuals and society. It is estimated that knee osteoarthritis affects more than 10% of people over the age of 60.[6,7] The societal burden is comprised of various costs, such as sickness benefits, joint replacement surgeries, and disability pensions.[8]

As the population ages, the prevalence of osteoarthritis increases, and its consequences have a significant impact on society.[9] It is a disease manifested by pain and inflammation due to the involvement of the articular cartilage, soft tissues, and bone.[10] Older people with this disease also experience depression, poor quality of life, and financial hardship.[11]

According to the American College of Rheumatology, "Osteoarthritis is a heterogeneous group of conditions characterized by a wide range of symptoms and joint signs, which in combination with defective articular cartilage integrity and structural changes in the subchondral bone and joint margins, account for the disease's key clinical–anatomopathological characteristics."[12-14]

According to the National Health Portal (NHP) of India, OA is the second most frequent rheumatologic disease and also the most common joint disease, with 22% to 39% prevalence ranging in India. Females are more likely than males to have osteoarthritis. Nearly half of all women above the age of 65 experience symptoms, and 70% have radiological evidence of the condition.[15]

Patients with osteoarthritis are more likely to experience increased physical limitations, pain, and activity impairment as the disease progresses. As a result, these patients experience progressive increase in the impact on their daily activities, resulting in losses in labor relations, social activities, leisure, and sleeping quality, as well as a significant increase in their disabilities and decrease in their quality of life.[16] Thus, the quality of life and disabilities of patients with osteoarthritis are important outcomes to assess.

There are not enough community-based health centers, occupational therapists, health programs, or a safe environment for elderly patients to exercise and stay fit in India. There is very less information related to the prevalence and impact of osteoarthritis in the Indian communities, as well as policies and the use of public health services by people with osteoarthritis.[17]

Thus, this study is being carried out at a tertiary care hospital to assess the quality of life, health status, walking ability, functional disability, and functional limitation in people living with Osteoarthritis.

Material and Methods

Study design and setting

A cross-sectional descriptive study was conducted at orthopedic O.P.D. of tertiary care teaching hospital of Basni, Jodhpur (Rajasthan), India from 30 April 2021 to 30 September 2021.

Study participants and sampling

Convenience sampling technique was used to select samples (n = 150). Sample size calculation was done on the basis of previous research prevalence.[18] Inclusion criteria for selecting the participants who were willing to participate in the study and able to speak and understand Hindi or English language and must be in age group 45 to 65 years. Patients who were having history of trauma and undergoing TKR surgery were excluded. Pilot study was conducted on 10% sample size was found feasible.

Data collection tool and technique

The standardized questionnaires SF-36 and the Western Ontario and McMaster Universities Arthritis Index (WOMAC) were used for data collection. Interview technique was adopted to collect data from patients.

Sociodemographic variables

The tool includes 14 sociodemographic variables age, gender, religion, marital status, dietary habits, educational status, residential area, chronic illness, BMI, monthly income, occupation, exercise, type of family and duration of osteoarthritis.

Standardized questionnaire

The SF-36 questionnaire was used to measure the Quality of life. It is a reliable and valid tool. It yields an eight-scale profile including functional health and mental health – physical functioning (PF), role

physical (RP), vitality (VT), mental health (MH), role emotional (RE), social functioning (SF), bodily pain (BP), and general health (GH). This tool is open access to use in non-commercial purpose. The scores are weighted sums of the questions in each section. Score range from 0–100. Lower scores suggest more disability and higher scores suggest less disability. Score 0–50 indicates poor quality of life and 51–100 indicates good quality of life in each section. The scoring instruction was taken from the original website. Reliability for all domains of SF-36 was greater than 0.75.[19]

The WOMAC is a standardized validated instrument for measuring disease-specific outcomes in patients with osteoarthritis of the hip or knee and is recommended by the Outcome Measures for Arthritis Clinical Trials (OMERACT) for measurement of functional dimensions. WOMAC has three subscales, that is, pain, stiffness (stiff), and physical functional disability (functions). The instrument consists of 24 items on three subscales: pain (5 items), stiffness (2 items), and physical function (17 items). Written Permission was obtained to use the tool in present study. The total score of WOMAC is 96 which are categorized according to severity level in which 0 score for None, 1 for slight, 2 for moderate, 3 for severe and 4 for extreme pain, stiffness and functional difficulties respectively. Reliability for three dimensions were 0.83 for pain, 0.87 for stiffness and 0.96 for physical function.[20]

Ethical consideration

Ethical approval for the current study was taken from the institutional ethical committee (Reference no. AIIMS/IEC/2021/3603). Written informed consent was obtained from the patient for participating in the study.

Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences Program (SPSS) version 20. Descriptive statistics and inferential statistics were used for data analysis such as mean, frequency, percentage, standard deviation and Chi-square test.

Results

Description of socio-demographic variables of participants

Table 1 depicts that most of participants are distributed in all age group in which 31.3% were males and majority of participants were Hindu (76%), whereas 87.3% were married. Most of participants were vegetarian (70.7%) and majority (53.3%) were having primary school education. Most of the participants (60.7%) were lived in rural area. Furthermore 66.7% participants were not having any chronic illnesses whereas 12.7% were having diabetes mellites, 11.3% were hypertensive, 8% were both

Table 1: Frequency and percentage distribution of patient as per socio-demographic variables (*n*=150)

Personal variable	*f* (%)
Age Group (Years)	
45-50	37 (24.67%)
51-55	47 (31.33%)
56-60	21 (14%)
61-65	45 (30%)
Gender	
Male	47 (31.33%)
Female	103 (68.67%)
Religion	
Hindu	114 (76%)
Muslim	36 (24%)
Marital status	
Married	131 (87.34%)
Divorced/separated	2 (1.33%)
Widow/Widower	17 (11.33%)
Dietary Habits	
Vegetarian	106 (70.67%)
Non-Vegetarian	44 (29.33%)
Educational status	
No formal education	46 (30.67%)
Primary	80 (53.33%)
Secondary	22 (14.67%)
Sr. Secondary	2 (1.33%)
Residential area	
Rural	91 (60.67%)
Urban	59 (39.33%)
Chronic Illness	
Hypertensive	17 (11.33%)
DM	19 (12.67%)
HTN &DM	12 (8%)
Thyroid disease	2 (1.33%)
No	100 (66.67%)
BMI	
<18.5	10 (6.67%)
18.5-24.9	92 (61.33%)
25.0-29.9	48 (32%)
Exercise (at least 30 min)	
No	65 (43.33%)
Yes	85 (56.67%)
If yes, Everyday	4 (2.67%)
More than 3 times in a week	38 (25.33%)
Less than 3 times in a week	43 (28.67%)
If yes, Aerobic	18 (12%)
Anaerobic	67 (44.67%)
Type of family	
Nuclear	74 (49.33%)
Joint	61 (40.67%)
Extended	15 (10%)
Family Monthly income (in Rupees)	
≤20,000	39 (26%)
20,001-40,000	56 (37.33%)
>40,000	55 (36.67%)
Occupation status	
Unemployed	93 (62%)

Contd...

Table 1: Contd...

Personal variable	*f* (%)
Private Job	18 (12%)
Government Job	12 (8%)
Own business	20 (13.33%)
Agriculture	7 (4.67%)
Duration of Osteoarthritis	
1-5 year	83 (55.33%)
6-10 year	60 (40%)
>10 year	7 (4.67%)

hypertensive with diabetic and 1.3% were having thyroid disease. 61.3% participants were having BMI in range of 18.5-24.9. Furthermore 56.7% were doing exercise among them 28.7% were doing less than 3 times a week, 44.7% were doing anaerobic exercise and 12% were doing aerobic exercise. Majority of participant (37.3%) were having family monthly income in range of 20,000 to 40,000 rupees. However, majority of participants (62%) were unemployed. Most of participant 55.3% were having duration of osteoarthritis between 1 to 5 years, 40% were having duration of osteoarthritis between 6 to 10 year and 4.7% were having duration of osteoarthritis more than 10 years.

Finding related to quality of life of patients with osteoarthritis

Table 2 depict mean and SD in various domain of quality of life. Quality of life was good in role limitation due to emotional health (60 ± 38.43), emotional well-being/mental health (52.35 ± 9.5), social role functioning (53.25 ± 15.22), and poor in PF (45.3 ± 16.45), and role limitation due to physical health (35.33 ± 32.67), energy fatigue/VT (43.2 ± 14.05), BP (40.52 ± 15.16), and GH (44.6 ± 11.7). Health change mean and SD 37.33 ± 17.07.

Self-reported disability in patients with osteoarthritis

The data presented in Table 3 shows that patients are having highest score of pain in "climbing stairs" with sum score of total samples is (458) followed by walking (389), standing (273), sleeping at night (217) and least pain in "Resting" (173).

The data presented in Table 4 shows that patients are having highest score of stiffness in the "Morning" with sum of total sample score 383 than in "Evening" with score 231.

The data presented in the Table 5 shows that patients are having highest score of functional difficulty in "Doing heavy domestic duties (moving furniture)" with sum of total samples score 477 followed by ascending stairs 428 than getting on/off toilet 372 and least difficulty in "Lying in bed" with sum of total samples score 189 followed by putting on socks 207, taking off socks 216 than getting in/out of bath 219.

Association of quality of life with selected socio-demographic variables

The significance was tested at the level of 0.05. Data presented in Table 6 reveals the finding that there is significant association of PCS [Physical component summary score (PF, RP, BP, GH)] with gender, religion, marital status, dietary habits, educational status, chronic illness, exercise, family monthly income, occupation status and duration of osteoarthritis. There was no significant association of PCS with age, residential area, BMI and type of family.

The MCS [Mental component summary score (MH, RE, VT, SF)] is also significantly associated with educational status, exercise, type of family and duration of osteoarthritis. There was no significant association of MCS with age, gender, religion, marital status, dietary habits, residential area, chronic illness, BMI, family monthly income and occupation status.

Association of self-reported disability with selected socio-demographic variables

The significance was tested at the level of 0.05. The data presented in Table 7 reveals the finding that there is significant association of self-reported disability in patients with gender, religion, dietary habit, chronic illness, exercise family income, occupation status and duration of osteoarthritis. There is no significant association self-reported disability in patients with osteoarthritis with age, marital status, education status, residential, BMI, and type of family.

Discussion

Osteoarthritis is a major public health concern that causes significant illness, disability, and pain for those who are affected around the world, as well as enormous medical costs for disease management. Lower limb osteoarthritis patients exhibit decreased mobility and ADL capability. A similar study was conducted by Abhishek Jaiswal *et al*.[21] in which history of a knee injury, smoking status, current physical activity and a family history of knee pain were significantly associated with knee osteoarthritis, The Quality-of-life scores of elderly adults with knee osteoarthritis was considerably lower in a multivariate logistic regression model. The elderly with knee osteoarthritis had considerably lower scores in all dimensions, with the psychological and physical domains having the greatest impact.

In another study conducted by Berat Meryem Alkan *et al*.,[22] it was found that there was significant association between pain severity and disability in patients with

Table 2: Domain wise quality of life of patients with osteoarthritis *n*=150

Domains	Mean±SD	Quality of life
Role limitation due to Emotional health (RE)	60±38.43	Good
Emotional well-being/mental health (MH)	52.35±9.5	Good
Social role functioning (SF)	53.25±15.22	Good
Physical functioning (PF)	45.3±16.45	Poor
Role limitation due to physical health (RP)	35.33±32.67	Poor
Energy fatigue/vitality (VT)	43.2±14.05	Poor
Bodily Pain (BP)	40.52±15.16	Poor
General health (GH)	44.6±11.71	Poor
Health Change	37.33±17.07	Poor

Table 3: Self-reported disability in terms of pain in patients with osteoarthritis *n*=150

WOMAC (Pain)	Total score	Rank
Climbing stairs	458	1
Walking	389	2
Standing	273	3
Sleeping at night	217	4
Resting	173	5

Table 4: Self-reported disability in terms of Stiffness in patients with osteoarthritis *n*=150

Stiffness	Total score	Rank
Morning	383	1
Evening	231	2

Table 5: Self-reported disability in terms of functional difficulty in patients with osteoarthritis *n*=150

Functional Difficulty	Total score	Rank
Doing heavy domestic duties (moving furniture)	477	1
Ascending stairs	428	2
Getting on/off toilet	372	3
Rising from sitting	368	4
Bending to floor	310	5
Descending stairs	297	6
Doing light domestic duties (cooking, dusting)	283	7
Standing	281	8
Going shopping	275	9
Rising from bed	275	9
Getting in/out of car	269	10
Sitting	258	11
Walking on even floor	254	12
Getting in/out of bath	219	13
Taking off socks	216	14
Putting on socks	207	15
Lying in bed	189	16

self-reported osteoarthritis. The finding of the study is similar to the current study that there was more disability score in those patients who were having severe pain and chronic osteoarthritis.

Another similar study conducted by Antonio Montero *et al*.,[18] result of the study was a statistically significant impairment in all subscales of quality of life, except role emotional and GH scores but in the current study only role emotional scores are good and other all domains are indicating poor quality of life. In patients with osteoarthritis, domains related to physical health status have lower scores than domains related to mental health. The lower scores in physical health components compared with mental components are consistent with other similar studies.[18,21,22]

A study conducted at Mangalore city, India by H. N. Harsha Kumar *et al*.[23] showed the result that osteoarthritis had impact on health-related quality of life. It was observed in the study that the impact was mainly influenced by the duration of disease. As the duration of disease increased, the PF decreased, and the Role limitation due to physical health (RP) increased which is contrary to present study result finding of RP sub scores, that PF is poor and RP is also poor. Whereas in mental component domain patients with lesser duration have lower emotional well-being and higher limitation due to emotional problems similar finding observed in current study that all the mental health components have good subscores. In a similar study conducted in Brazil[24] showed the result that patients with osteoarthritis of the knee have a low perception of their quality of life, particularly in terms of functional capability, functional restrictions, and pain. In the study, it is found that there is a strong association between a low educational level and a poor quality of life, similar findings were obtained in the current study.

Strength of study

- Bilingual translation of standardized tools.
- Adequate sample size.

Limitation and recommendation

- The study was conducted in a limited time period.
- Further studies can be carried out to assess the prevalence of osteoarthritis.
- Multi-center study and large sample size study can also be done.

Conclusions

The present study aimed to assess quality of life and self-reported disability in patients with osteoarthritis. The study indicates that majority of sample were females with OA and had poorer quality of life in domains PF, role limitation due to RP, VT, BP, and GH, whereas patients with osteoarthritis had good quality of life in role limitation due to RE, MH, and SF. Patients with osteoarthritis show highest self-reported disability in terms of pain in climbing stairs, in terms of stiffness during morning, and in terms of functional difficulties during doing heavy domestic duties.

Table 6: Association of quality of life of patients with osteoarthritis with selected Sociodemographic variables *n*=150

Personal variable	PCS			MCS		
	Poor	Good	*P*	Poor	Good	*P*
Age Group (Years)						
45-50	30	7	0.620	13	24	0.820
51-55	38	9		19	28	
56-60	17	4		7	14	
61-65	32	13		14	31	
Gender						
Male	30	17	0.005*	15	32	0.554
Female	87	16		38	65	
Religion						
Hindu	95	19	0.005*	43	71	0.277
Muslim	22	14		10	26	
Marital status						
Married	98	33	0.047*	46	85	0.909
Divorced/separated	2	0		1	1	
Widow/Widower	17	0		6	11	
Dietary Habits						
Vegetarian	89	17	0.006*	39	67	0.562
Non-Vegetarian	28	16		14	30	
Educational status						
No formal education	45	1	0.000*	21	25	0.000*
Primary	52	28		16	64	
Secondary	18	4		14	8	
Sr. Secondary	2	0		2	0	
Residential area						
Rural	68	23	0.229	31	60	0.687
Urban	49	10		22	37	
Chronic Illness						
Yes	49	0	0.000*	19	30	0.539
No	68	33		34	67	
BMI						
<18.5	10	0	0.219	2	8	0.071
18.5-24.9	70	22		39	53	
25.0-29.9	37	11		12	36	
Exercise (at least 30 min)						
No	64	1	0.000*	41	24	0.000*
Yes	53	32		12	73	
Type of family						
Nuclear	56	18	0.313	22	52	0.024*
Joint	47	14		21	40	
Extended	14	1		10	5	
Family Monthly income (in Rupees)						
≤20,000	36	3	0.001*	20	19	0.051
20,001-40,000	35	21		16	40	
>40,000	46	9		17	38	
Occupation status						
Unemployed	78	15	0.003*	32	61	0.089
Private Job	8	10		4	14	
Government Job	9	3		2	10	
Own business	15	5		11	9	
Agriculture	7	0		4	3	
Duration of Osteoarthritis						
1-5 year	55	28	0.001*	26	57	0.032*
6-10 year	55	5		27	33	
>10 year	7	0		0	7	

PCS-Physical component summary score (PF, RP, BP, GH). *Significant *P*<0.05. MCS- Mental component summary score (MH, RE, VT, SF)

Table 7: Association of self-reported disability in patients with osteoarthritis with selected Sociodemographic variables *n*=150

Personal variable	Self-reported disability		*P*
	Moderate Disability (score ≤24)	Severe disability (score>24)	
Age Group (Years)			
45-50	3	34	0.536
51-55	7	40	
56-60	3	18	
61-65	3	42	
Gender			
Male	11	36	0.001*
Female	5	98	
Religion			
Hindu	8	106	0.010*
Muslim	8	28	
Marital status			
Married	16	115	0.273
Divorced/separated	0	2	
Widow/Widower	0	17	
Dietary Habits			
Vegetarian	7	99	0.012*
Non-Vegetarian	9	35	
Educational status			
No formal education	1	45	0.139
Primary	12	68	
Secondary	3	19	
Sr. Secondary	0	2	
Residential area			
Rural	12	79	0.214
Urban	4	55	
Chronic Illness			
Yes	0	49	0.003*
No	16	85	
BMI			
<18.5	0	10	0.505
18.5-24.9	10	82	
25.0-29.9	6	42	
Exercise (at least 30 min)			
No	0	65	0.000*
Yes (Anaerobic)	16	69	
Type of family			
Nuclear	12	62	0.093
Joint	3	58	
Extended	1	14	
Family Monthly income (in Rupees)			
≤20,000	0	39	0.000*
20,001-40,000	15	41	
>40,000	1	54	
Occupation status			
Unemployed	4	89	0.000*
Private Job	9	9	
Government Job	3	9	
Own business	0	20	
Agriculture	0	7	
Duration of Osteoarthritis			
1-5 year	16	67	0.001*
6-10 year	0	60	
>10 year	0	7	

[#]No patients were found in No disability (0). *Significant *P*<0.05. Sutbeyaz ST, Sezer N, Koseoglu BF, Ibrahimoglu F, Tekin D. Influence of kneeosteoarthritis on exercise capacity and quality of life in obese adults. Obesity (Silver Spring) 2007;15:2071-6.

Acknowledgements

We express our sincere gratitude to the study participants for being part of this study and sharing their valuable time and information. We are also thankful to administration of the study setting for providing much needed support and guidance.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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