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Original Research Article

QUALITY OF LIFE AMONG ADULTS (18-50 YEARS) WITH KNEE OSTEOARTHRITIS ATTENDING A TERTIARY CARE HOSPITAL, VISAKHAPATNAM, ANDHRA PRADESH

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ABSTRACT

Background: Osteoarthritis (OA) is the second most common rheumatologic problem and the most common joint disease in India. The burden of OA must be addressed to diminish the quality of life lost due to disability and functional restrictions as well as the resulting economic effect. The objective was to assess the quality of life and to study the distribution of the risk factors associated with knee OA.

Materials and Methods: A Cross-sectional study was conducted among the patients for a period of two years diagnosed with knee osteoarthritis attending the clinics of tertiary care hospital between age of 18-50 years with a sample size of 200. A Standard validated SF 36 Questionnaire was used for assessment of the Quality of Life.

Results: Majority were female (72%) and married (92%), aged between 41-50 years (80%) with mean age of 45.15 + 5.51 years. Mostly illiterates (59%) and belonging to upper lower class (60%). The assessment of quality of life, where 78% and 60% of the study population had poor quality of life in physical and mental components of quality of life respectively.

Conclusion: Excessive physical activity, repetitive knee bending, menopause and its duration in females, high BMI, H/O knee injury, were some of the significant risk factors associated with early onset of OA knee. Overall, physical health was involved more than mental health. Health education can help prevent osteoarthritis and improve quality of life. A health programme for osteoarthritis is recommended to prevent the early onset of OA.

Keywords: Young Knee OA, Obesity, excessive physical activity, knee bending, Andhra Pradesh.

INTRODUCTION

Osteoarthritis (OA) is the second most common rheumatologic problem and the most common joint disease in India, with a prevalence of 22 to 39 per cent.[1] It is a chronic, progressive musculoskeletal disorder characterised by gradual loss of cartilage in joints, causing stiffness, pain, tenderness, joint swelling, and impaired movement. These limitations make it difficult to do daily tasks like holding a cup or lifting a grocery bag, as well as walking and standing limitations, sleep disorders, lethargy, numbness, and instability.[2] Knees, hips, hands, feet, and spine are the most commonly affected joints3 While OA is attributed to the ageing process, it is also related to several modifiable and non-modifiable risk factor.[2]

As the prevalence of OA increases due to sedentary lifestyle practices and ageing, younger people are more prone to injury-induced OA. Secondary arthritis affects the joints earlier in life due to specific factors such as injury from work that requires frequent

kneeling or squatting for long periods can cause joint damage or overuse, diabetes, and obesity adding burden on weight bearing joints are the modifiable OA risk factors.[2] Gender, age, genetics, and ethnicity are examples of non-modifiable risk factors. Adolescents and young adults who sustain anterior cruciate ligament (ACL) injuries are more likely to develop OA before age 40. As early as 20 months after an accident, post-traumatic osteoarthritis (PTOA) is recognised as a debilitating condition,[4] more prevalent in females than in males.[5] The chance of getting symptomatic knee OA is 45 per cent over a lifetime. Anyone who injures or overuses their joints, such as sports, military personnel, and those who have physically demanding jobs, may be more prone to acquiring this condition as they get older.[3] As osteoarthritis is the most common cause of impairment in adults, diagnosis of OA in athletes is usually delayed and challenging due to the athlete's high pain tolerance and desire to return to play as soon as possible.

Osteoarthritis is the fifth most common cause of disability worldwide and accounts for 17 million years of disability.[4] The highest prevalence of OA is found in Europe and the United States.[7]

A higher percentage of people with OA suffer depression (12.4%), and the disease's pain, fatigue, deformity, and mobility limits lead to social isolation, which influences all of their relationships. The burden of OA must be addressed to diminish the quality of life lost due to disability and functional restrictions as well as the resulting economic effect. Knee OA is commonly accompanied by comorbidities, which lead to a lower quality of life.[6] Osteoarthritis has been more common among Indians in their 30s and 50s in recent decades, and it continues to have a severe impact.[7] Knee OA accounts for more than half of all OA cases worldwide.[6] The prevalence of symptomatic knee OA has been rising for decades, coinciding with an ageing population and a growing obesity epidemic, also rising economic burden.[1]

Andhra Pradesh has the highest prevalence of OA and Rajasthan with the lowest.[8]

Significant risk factors in India include the large proportion of people living in rural regions who work in jobs that require heavy physical labour, cultural differences such as sitting cross-legged, squatting, using Indian toilets, and walking without suitable footwear.[9] Nearly 80% of patients with knee discomfort have OA, with approximately 20% reporting incapacity in everyday activities and around 11% requiring special care.[9]

According to a study conducted in Andhra Pradesh, 68 per cent of patients complain of joint pain, and 43.9 per cent population suffer from depression with OA in Visakhapatnam.[7] The rising expenses of health care, when combined with the increased prevalence of knee OA, may impact a significant economic burden on society in the future.

The objectives of the study were to assess the quality of life among adult patients suffering from knee osteoarthritis and to study the distribution of the risk factors associated with knee OA.

MATERIALS AND METHODS

A Cross-sectional study was done among the patients for a period of two years (October 2019 – October 2021) diagnosed with osteoarthritis of knee attending the clinics of tertiary care hospital of Visakhapatnam, Andhra Pradesh of age between 18-50 years with at least six months of diagnosis. Patients suffering from comprehensive disabilities, mental illness and traumatic injury at the time of enrolment were excluded. Sample size was 200, calculated by taking an error of 0.05 by the formula $Z^2 PQ/L^2$.[9]

A pretested semi-structured questionnaire was used for reporting general information and assessment of the risk factors. A Standard validated SF 36 Questionnaire was used for assessment of the Quality of Life. The study was done among study participants who attended the Outpatient department of Orthopaedics and Physiotherapy. After informed consent, the data was collected from participants satisfying the inclusion criteria. The study was conducted after Institutional Ethics Committee clearance and approval from the respective authorities.

Data analysis: Data was entered in MS Excel and analysed using Statistical Package for social sciences (SPSS) software version 17. The socio-demographic data and risk factors were expressed in terms of means and proportions. All the 8 domains of SF 36 questionnaire were expressed in terms of means and standard deviations. Scoring for each domain of quality of life was done using RAND SF 36 questionnaire. Each question carries a maximum score of 100, and a total maximum score of 3400 was given. The overall quality of life among the study participants with less than 50% of the total score was graded as poor quality of life, and more than 50% of the total score was graded as better quality of life. So higher the score, the better and the lower the score, the poorer the quality of life. Independent T-test for two independent groups and ANOVA for more than two groups was applied for statistical significance and a p-value of less than 0.05 was considered significant.

RESULTS

The sample consisted of 200 participants mostly female (72%) and married (92%), aged between 41-50 years (80%) with mean age of 45.15 + 5.51 years. Mostly illiterates (59%) and belonging to upper lower class (60%).

Table 1: Socio demographic Characteristics of the study population

	Characteristics	Percentage(N=200)
Age	21-30 years 31-40 years 41-50 years	04 (2%) 36 (18%) 160 (80%)
Gender	Male Female	28% (56) 72% (144)
Level of education	Illiterates Primary education Secondary education Graduates	59% (118) 11% (22) 24% (48) 6% (12)
Socio-Economic Status*	Upper middle Lower middle Upper lower Lower	3% (6) 10% (20) 60% (120) 27% (54)
Marital status	Single Married Divorced Widow	1% (2) 92% (184) 1% (2) 6% (12)

*Modified Kuppuswamy classification for SES was considered.

Table 2: Association of risk factors with OA knee among study subjects

Risk factors	Percentage (N=200)
Muscle weakness	3% (6)
H/o of Menopause No Yes Duration of Menopause 1-5 years 5-10 years 11-20 years 21-30 years	N=144 26% (37) 74% (107) 61% (65) 31% (33) 4% (5) 4% (4)
Duration of Osteoarthritis 0-1 year 1.1 – 5 years 5-20 years 21-40 years	 41% (82) 54% (108) 3% (6) 2% (4)
H/o Knee surgery	3% (6)
H/o Knee injury	18% (36)
H/o Knee bending	72% (144)
Physical Activity	92% (184)
Comorbidities Diabetes (DM) Hypertension (HTN)	 11% 17%

Table 3: Assessment of Quality of Life (QOL)among study subjects

Components of quality of life	Maximum score	Mean + SD	mean % score	Poor QoL (<50%)	Good QoL (>50%)
Physical component	2100	826.5 + 310.65	39.3	78%	22%
Mental component	1400	659.1 + 245.24	47	60%	40%

[Table 3] shows the assessment of quality of life where 78% and 60% of the study population had poor quality of life in physical and mental components of quality of life respectively. Physical and mental components of the quality of life was better in 22% and 40% of the study population.

Table 4: Mean scores of individual domains of the quality of life among study subjects

	Domains of Quality of life	Mean + Standard Deviation	Mean percentage scores
Physical Health Domains	Physical function (PF)	476 + 178.16	47.6
	Role limitations due to physical health (RL- PH)	45 + 9.885	11.25
	Pain	86 + 39.36	43
	General health (GH)	219.5 + 78.94	43.9
Mental Health Domains	Role limitations due to emotional problems (RL- EP)	96 + 13.251	32
	Energy / fatigue (EP)	181.2 + 54.96	45.3
	Emotional well-being (EWB)	266.4 + 81.98	53.28
	Social functioning (SF)	115.5 + 44.91	57.75

Among all the domains of the SF 36 questionnaire used for assessing the quality of life of the participants, there were more limitations due to physical health (11.25%) which was the least, followed by role limitations due to emotional problems (32%) and increased pain (43%) domains and social functioning found to be the better domain (57.75%) of quality of life. [Table 4]

In the present study, it was observed that as age advances, the following components compromised the quality of life of study subjects which was statistically significant - Pain (p<0.001), Physical function (p<0.001), Role limitations due to physical health (p<0.001), Role limitations due to emotional problems (p=0.03) and social functioning (p<0.001)

Table 5: Factors influencing the quality of life among study subjects

Factors	PF	RL - PH	RL - EP	EF	EWB	SF	Pain	GH
Age	0.000	0.000	0.001	0.038	0.162	0.000	0.000	0.93
Gender	0.57	0.001	0.83	0.93	0.87	0.67	0.64	0.06
Level of Education	0.39	0.05	0.03	0.015	0.256	0.03	0.008	0.193
Socio economic status	0.001	0.000	0.19	0.09	0.33	0.09	0.003	0.000
BMI *	0.00	0.63	0.00	0.23	0.65	0.007	0.46	0.009
Duration of OA	0.02	0.53	0.08	0.01	0.001	0.006	0.007	0.092
H/o of Menopause	0.08	0.16	0.27	0.001	0.67	0.01	0.08	0.83
Duration of menopause	0.003	0.647	0.04	0.24	0.81	0.00	0.12	0.30
Involvement of knee joint Unilateral (37%) Bilateral (63%)	0.004	0.02	0.31	0.001	0.11	0.01	0.01	0.00
H/o of knee injury	0.97	0.37	0.11	0.67	0.03	0.20	0.01	0.10
H/o of knee surgery	0.00	0.00	0.00	0.06	0.001	0.003	0.08	0.38
H/o of knee bending	0.56	0.65	0.001	0.54	0.09	0.64	0.95	0.83
Presence of comorbidities	0.162	0.112	0.46	0.19	0.39	0.17	0.41	0.20
Presence of diabetes	0.51	0.73	0.18	0.69	0.63	0.09	0.16	0.10

* BMI -Pan Asian Classification was considered

DISCUSSION

The means scores percentages of the physical component of QoL were significantly low indicating poor physical quality of life among study subjects, findings similar to other studies Sudeepthi Ratan Srivastava et al,[10], Shigeyuki Muraki et al,[11] Abbey C. Thomas et al,[12] and Ross Wilson et al. [13]

In the present study, role limitations due to physical health (11.25%), the most affected domain, and social functioning (57.75%) were the least affected among the study subjects. [Table 4]. Similar to findings of Ross Wilson et al. [13] Sudeepthi Ratan Srivastava et al. [10] . In contrast to R.N. Srivastava et al. [14] where the affected domains were energy/fatigue and pain with social functioning and role limitations by emotional issues domains performing better.

In this study, it was observed that the mean scores of the domains of quality of life were less, indicating poor quality of life as compared to the study by Sudeepthi Ratan Srivastava et al,[10] but higher than that of the study by Marico Massao Kawano et al. [15]

In the current study, 80% of the study population were 41-50 years old with mean age 45.15 + 5.51 years [Table 1], similar to findings of R.N. Srivastava et al,[14] (mean age 50.38 + 12.08 years). It was also observed that nearly all the cases were observed to be around 30-50 yrs of age signifying an early onset of rise of cases before 50 years, the findings of which were similar to Marita Cross et al,[16] and in contrast to Sudeepti Ratan Srivastava et al,[10] concludes that age does not make a significant variation to OA. It was observed that advancing age is associated with compromised Physical & Social functioning, increased severity of pain & fatigue as well as emotional disturbances, similar to findings of R.N. Srivastava et al. [14] and in contrast to Marico Massao Kawano et al,[15] where the age factor had no influence on QoL of OA knee.

More than 70% of the study population were females, signifying females were more affected than males, similar to findings of Marita Cross et al., a systematic review,[16] Sudeepti Ratan Srivastava et al.[10] And in contrast to Ilana N. Ackerson et al,[17] a systematic review, Thomas Rehling et al,[18] where males (55.6%) are affected, Helene Sandmark et al,[19] where males are more affected, Margeth Grotle et al. observing no impact of gender on OA knee incidence.[20]

Among study participants, Role limitations due to physical health were significantly compromised in females when compared to males, findings similar to R.N. Srivastava et al,[14] where emotional problems, physical function (P=0.04), general health (P = 0.008) and pain (P < 0.001) were affected across gender. Shigeyuki Muraki et al,[11] reported an association of OA knee with low QOL scores among the women. In contrast to findings of Marcio Massao Kawano et al,[15] where gender has no significant association in terms of limitations or pain.

In the present study, Majority (92%) were married and no significant association was observed with quality of life of study subjects, Similar to findings of Marico Massao Kawano et al,[15] and in contrast to Thomas Rehling et al,[18] where the study reported an association.

Around 60% of the study participants were illiterates and a significant association was observed between low level of education & QOL in domains of physical and emotional health, fatigue, social functioning and pain severity, findings similar to Marico Massao Kawano et al,[15] where a low level of education was associated with low perception of quality of life. In contrast to findings of Sudeepti Ratan Srivastava et al,[10] where no significant association was reported.

Three fifths of the study population belonging to the upper lower class (60%). The physical component of quality of life was significantly compromised within low socio-economic groups. Similar to the findings of Leigh F Callahan et al,[21] Rebecca J Cleveland et al,[22] where lower SES was indirectly associated with poor function and severe pain (WOMAC score).

The mean BMI of the study population was 24.96 + 4.1. A higher BMI was significantly associated with a decline in general health& physical function, emotional problems & leading to social isolation ($p< 0.001$) among patients of OA knee in the present study, similar to findings of Margreth Grotle et al. [20] In a study by Sudeepti Ratan Srivastava et al,[10] there was a significant association between BMI quality of life. Similar findings were also observed in Marita Cross et al,[16] Ilana N. Ackerson et al,[17] Shawn Farrokhi et al,[23] Abbey C. Thomas et al. [12] Thomas Rehling et al,[18] Cyrus Cooper et al. [24]

Even though excessive physical activity was observed as a significant factor among study subjects, there was no association observed with QOL in the present study, in contrast to the findings of Shawn Farrokhi et al,[23] where Strenuous activities like running, jumping, and lifting heavy weights directly influence the incidence and disease progression of OA knee. Similar findings were also found in studies by D.F. McWilliams et al,[25] Helene Sandmark et al,[19] Cyrus Cooper et al. [24]

In the present study, a significant decline was observed in energy and social functioning among the study subjects suffering from OA knee with menopause. Similar observations were reported by Linda M. Gerber et al,[26] where OA was found to be associated with reduced physical function (P=0.003), role limitations due to emotional problems (P= 0.05) and vitality (P=0.1) and with better mental health. (OR = 0.62, P = 0.001) in menopausal women. An editorial by Mahajan A et al,[27] and James H. Herndon,[28] observed that the prevalence and incidence of OA knee increase after menopause.

Majority (95%) of the study population reported a history of OA of less than five years duration & 5% of more than five years. The domain of physical functioning, energy/fatigue, emotional wellbeing, social functioning and pain were significantly compromised among study subjects with more than 5 years duration. Similar to findings of Taher E Abd Elstaar et al,[29] where poor QoL is associated with higher (>5 years) duration of OA Knee. Also, in contrast to findings of Sudeepti Ratan Srivastava et al,[10] disease duration does not make a significant variation.

Comorbidities were not proven to affect the quality of life among study participants. In contrast to findings of Thomas Rehling et al,[18] Mariely Nieves-Plaza et al,[30] where diabetes was observed as an associated risk factor for OA; Annett Eitner et al,[31] observed worsening of the pain, physical health (0.03) in participants with DM.

18% of study participants had knee injury in whom worsening of pain and emotional well-being was observed. Similar to findings of Abbey C. Thomas et al,[12] Shawn Farrokhi et al,[23] and S.G. Muthuri et al,[32] where a history of knee injury is associated with development and progression of OA knee even in the younger individuals. L.S. Lohmander et al,[33] reported worsening of the physical functioning in study subjects whereas in Ilana N. Ackerson et al,[17] reported a poor mental health component in study subjects with knee injury.

Seventy-two per cent of the study subjects had reported repeated knee bending. Surprisingly the mental health component (P = 0.01) was significantly affected compared to physical domains of the quality of life. Similar findings were observed in Cyrus Cooper et al,[24] that those with prolonged or repeated knee bending had a higher risk of developing OA knee; D.F.Mc Williams et al,[25] and Helene Sandmark et al,[19] reported that squatting or knee bending as one of the strongest independent risk variables for OA knee, Ilana N. Ackerson et al observed the physical domain was significantly affected.[17]

Only 3% of study subjects had knee surgery in whom the physical function, emotional and social functioning was significantly poor (p = 0.00) compared to those without surgery. Similar to findings of Brooke Patterson et al,[34] where poor functional capacity and post-surgical complications were risk factors for early-onset OA; Abbey C. Thomas et al,[12] observed physical component of QOL was severely affected in OA knee patients with surgery (P<0.001)

Malalignment and muscle weakness was observed in 3% of the study participants. A study Shawn Farrokhi et al,[23] proposed muscle weakness as a non-systemic risk factor for the development and progression of OA knee in adults.

CONCLUSION

Overall, physical health was involved more than mental health. Role limitations due to physical health, the most affected domain, and social function were the least affected domain of QoL among study participants suffering from OA knee. As it is a hospital-based study, it is the limitation of the study.

Health education, first step in non-pharmacological care, can help prevent osteoarthritis and improve quality of life. Patients with high BMI should be encouraged to lose weight. Increasing their physical activity and exercise is beneficial even to those at a healthy weight because increased muscle strength can reduce some of the symptoms of OA

Patients should be counselled on coping skills, given resources like Knee braces, orthotics and proper footwear can help persons with poor quality of life by reducing discomfort and enhancing function. A health programme for osteoarthritis is recommended to prevent the early onset of OA.

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