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Functional Independence and Quality of Life and their Psychosocial Determinants among Patients with Knee Osteoarthritis

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Abstract | **Original Research Article**

Background of the Study**:* Knee osteoarthritis affects functional independence and quality of life. This study evaluated these outcomes and examined associations with psychosocial factors like depression, social support, and socio-demographic variables. ***Aim: A study to assess the functional independence, quality of life and psychosocial (Depression and Social support) determinants among patients with knee osteoarthritis. ***Methodology:*** A descriptive cross-sectional study was conducted among 100 patients diagnosed with knee osteoarthritis attending selected orthopedic hospitals in Bagalkot. Data were collected using standardized tools measuring functional independence, quality of life, depression, and social support. Descriptive statistics, Pearson's correlation, and chi-square tests were used for data analysis. ***Result:*** Functional Independence: Most patients had severe (47%) or moderate (44%) dependence; mean score 59.40 ± 15.96. Quality of Life: 84% reported good QoL; mean 74.13 ± 16.88. and psychosocial determinants Depression: 95% showed clinically significant depression; mean 25.02 ± 8.46. Social Support: 62% had high support; mean 66.75 ± 15.21. Correlations: Functional independence strongly positively correlated with QoL (r = 0.9881). and psychosocial determinants Depression negatively correlated with functional independence (r = -0.977) and QoL (r = -0.963). Social support positively correlated with functional independence (r = 0.988) and QoL (r = 0.963). Associations: Functional independence linked to age, occupation, OA grade/type, pain level, and chronic illness. QoL linked to age, occupation, income, alcoholism history, illness duration, OA grade/type, and pain. ***Conclusion**:* The findings indicate that knee osteoarthritis severely affects functional independence, and psychosocial factors such as depression and social support play a significant role in determining both functional ability and quality of life. These results highlight the importance of incorporating psychosocial assessment and support mechanisms into the clinical management of patients with knee osteoarthritis.

Keywords: Psychosocial predictors (Depression and Social support), functional independence, quality of life and knee osteoarthritis patients.

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INTRODUCTION

Bones are support to body and allow to move. They protect our brain, heart, and other organs from injury. Bone is a living, growing tissue. It is made mostly of two materials: collagen, a protein that provides a soft framework, and calcium, a mineral that adds strength and hardness. This combination makes bone strong and flexible enough to hold up under stress.[1]

Osteoarthritis (OA), is a common "wear and tear" disease. The underlying cause of this condition is typically chronic repetitive movement that results in inflammation and structural joint damage. Inflammation causes pain, redness, and swelling. This cycle of joint damage and inflammation leads to the break-down of cartilage that serves as a smooth gliding surface and cushion in the joints.[2]

Knee osteoarthritis (KOA) which is the main cause of musculoskeletal pain and impairment in the elderly. It decreases the quality of life. This problem often results in severe side effects, and in the second half of the life, it costs the heavy burden of treatment. Knee osteoarthritis includes the degeneration of cartilage with pain inside and around the knee joint, as well as joint stiffness, and decreased range of motion, which ultimately leads to muscle weakness and is the biggest cause of functional impairment.[3]

Among elderly patients with knee osteoarthritis who underwent rehabilitation, some actively participate

in society even if they have the same level of motor dysfunction, while others refuse to participate in the society due to fear of falling or fracture. The multiple factors, including not only motor function but also psychological and social factors, are involved in the HRQOL of elderly patients with knee osteoarthritis.[4]

Arthritis on disability is greater on physical functional limitations than on more complex social and role activities. Compared levels of functional limitation and disability for those with and without arthritis. Osteoarthritis experienced significant functional limitations in functions involving the hands compared to those who did not have hand OA, including writing, gripping, and manipulating small objects.[5]

MATERIAL AND METHODS

Study Design and Participants

Present study was a descriptive cross-sectional study conducted between May 2025 to June 2025. Convenience sample of 100 patients with knee osteoarthritis at selected orthopedic hospitals of Bagalkot. knee osteoarthritis patients whose age between 40-70 years and willing to participate were included in the study. The patients excluded who have under gone previous knee surgery and not ready to give written consent. Permission to conduct study was obtained from administrative approval from concerned authorities of selected hospitals of Bagalkot.

Sample: 100 Knee osteoarthritis patients whose age between 40-70 years who visiting selected orthopedic hospitals of Bagalkot.

Sample size estimation: The sample size determination with the assumption of Z value 1.96 with 95% confidence level, 5% of margin error. The present study was estimated using the fallowing formula

Based on results of pilot study.
Sample size= Z value2× SD2/ d2

Where,
Z= the value of normal variant at 95% confidence level i.e., Z value= 1.96.
SD= Standard deviation.
d= Expected allowable error in the mean [i.e., 5% of mean].
n= Z value2× SD2/ d2
$n = (1.96)^2 \times (14.49)^2 / (3.3)^2$
n= 3.84 x 209.96 /10.89
n =74.03

The highest sample size came for Barthel Index i.e. 74.03. The number determinants included in the study is 10 patients with knee osteoarthritis at selected hospital every considering this in order to improve the credibility and analysis of sample size for the present study was increased to 100.

Instruments:

Socio-demographic and clinical characteristics.

Socio-demographic and clinical characteristics includes age, gender, religion, education status, occupation, family monthly income, marital status, history of alcoholism, history of smoking/tobacco chewing, duration of illness, grade of osteoarthritis, level of pain, type of knee osteoarthritis, body mass index (BMI), and presence of chronic illness like DM, HTN, HIV, and Cancer.

Data Collection Procedures

Prior permission was taken from relevant hospitals before the beginning of data collection procedure. The study participants were identified during study period at selected orthopedic hospitals of Bagalkot. Every knee osteoarthritis patients who fulfilled the inclusion criteria was approached for data collection. Consent was obtained by the knee osteoarthritis patients. All the information collected was based on patient's self-report, but information related to functional independence, quality of life, depression and social support by the data collection.

Data Analysis

Data analysis was performed using SPSS v25. Descriptive statistics such as frequencies and percentages were used for socio demographic variables and clinical characteristics. Calculation of mean, Standard Deviation for functional independence, quality of, depression and social support scores. relation between the functional independence and quality of life with selected psychosocial determinants was found using karl pearson coefficient of correlation formula. Association between functional independence and quality of life with their selected sociodemographic and clinical variables was founded using chai square test.

RESULT

Socio-demographic and Clinical profile among knee osteoarthritis patients

Knee osteoarthritis was distributed according to age, the majority of patients were in the age group 50-60 years (47%). 67% of knee osteoarthritis patients were belongs to males and majority were Hindus (81%). Highest number of knee osteoarthritis patients were belonged to up to SSLC (31%) and knee osteoarthritis patients were spread out in variety of occupation with highest being homemaker and employed (28%). Majority of knee osteoarthritis patients (49%) had monthly family income between Rs10,001to Rs 20,000/-, 89% of knee osteoarthritis patients were married. Majority of knee osteoarthritis patients (67%) were no history of Alcoholism and (50%) of were history of smoking/tobacco chewing and remaining (50%) percent of them were no history smoking/tobacco chewing. Majority of knee osteoarthritis patients (37%) were suffering from 5-6 years, and majority of knee osteoarthritis patients (37%) of were belongs to Grade-

2(mild or minimal) knee osteoarthritis. majority of knee osteoarthritis patients (32%) were suffering level of widespread pain. (57%) of knee osteoarthritis patients were belongs to unilateral knee osteoarthritis. majority of knee osteoarthritis patients (50%) of them were overweight. majority of knee osteoarthritis patients (63%) of them were had chronic illness.

Description of functional independence of patients with knee osteoarthritis.

Majority of knee osteoarthritis patients (47%) had severe dependence and (44%) had moderate dependence, (06%) had total dependence and (03%) had slight dependence.

Table 1: levels of functional independence

Sl. No	Level of functional independence	Range of score	Frequency	Percentage
1	Total dependence	0-20	06	06%
2	Severe dependence	21-60	47	47%
3	Moderate dependence	61-90	44	44%
4	Slight dependence	91-99	03	03%

Description of Quality of Life of patient's knee osteoarthritis.

Majority of knee osteoarthritis patients (84%) had good quality of life and (16%) had poor quality of life.

Table 2: levels of quality of life

Sl. No	Level of quality of life	Range of score	Frequency	Percentage
1	Poor	<60	16	16%
2	Good	≥60	84	84%

Description of Psychosocial determinants (Depression and social support) among patients with knee osteoarthritis.

Section A: Description of subjects in terms of their Depression of patients with knee osteoarthritis.

As per the findings Majority of patients with knee osteoarthritis (95%) had Clinically significant and (05) had mild or no-significant.

Table 3: level of depression of patients with knee osteoarthritis.

Sl. No	Level of Depression	Range of score	Frequency	Percentage
1	Mild or no-significant	0-15	05	05%
2	Clinically significant	16-60	95	95%

Description of subjects in terms of their social support.

As per the findings majority of knee osteoarthritis patients (66%) had Moderate social support, (39%) had high social support, and (05%) had poor social support.

Table 4: level of social support among knee osteoarthritis patients.

Level of social support	Range of score	Frequency	Percentage
Poor	<32	07	07%
Moderate	32-64	31	31%
High	>64	62	62%

Correlation between Functional independence and Quality of life of patient with knee osteoarthritis.

Findings shows that there was a Significant positive correlation (r= 0.9881, P<0.0001) between functional independence and Quality of life of patients with knee osteoarthritis.

Table 5: Relationship between Functional independence and Quality of life of patients with knee osteoarthritis.

CORRELATION	PEARSONS 'R'	P VALUE
Functional independence and Quality of life	0.9881	0.00001**

Significant P<0.05

Section B: Correlation between Psychosocial determinants (depression and social support), Functional independence score and Quality of life of patients with knee osteoarthritis.

Finding displays that depression and functional independence were negatively correlated (r = -0.977), Furthermore, depression were negatively correlated with quality of life (r = -0.963),

Findings also shows that, social support and functional independence were positively correlated (r = 0.988), Furthermore, social support were positively correlated with quality of life (r = 0.963),

Table 6: Assess the relationship between Psychosocial determinants (depression and social support), Functional independence and Quality of life of patients with knee osteoarthritis (by using karl Pearsons coefficient of correlation)

Variables	Depression	Social support
Functional independence	-0.977**	0.988**
Quality of life	-0.963**	0.963**

**P<0.01, *P<0.05

Table 7: Association between Functional independence and their selected socio-demographic and clinical variables

SI. NO.	Variables	Df	Chi- Square Value	P Value
1	Age	6	15.522	0.017*
2	Gender	3	1.781	0.619
3	Religion	3	5.856	0.119
4	Education status	9	9.960	0.354
5	Occupation	12	28.643	0.004**
6	Family monthly income	9	6.778	0.660
7	Marital status	3	2.584	0.460
8	History of alcoholism	3	0.049	0.997
9	History of smoking/tobacco chewing	3	1.229	0.746
10	Duration of illness	9	12.713	0.176
11	Grade of osteoarthritis	12	30.934	0.002**
12	Level of pain	9	51.453	0.000***
13	Type of knee osteoarthritis	3	16.851	0.001**
14	Body mass index (BMI)	9	13.391	0.146
15	Presence of chronic illness (DM, HTN, HIV, Cancer, etc.)	3	8.916	0.030*

*P<0.05 (Significant) Df – Degree of freedom

The findings related to the Association between Functional independence of patients with Knee osteoarthritis and their selected socio-demographic and clinical variables reveals that there was significant association was found between Functional independence of knee osteoarthritis patients with their Age (χ^2=15.52, P<0.5), Occupation (χ^2=28.64, P<0.5), Grade of osteoarthritis (χ^2=30.93, P<0.5), Level of pain (χ^2=51.45, P<0.5), Type of knee osteoarthritis (χ^2=16.85, P<0.5), presence of chronic illness (χ^2=8.91, P<0.5).

Table 7: Association between quality of life and their selected socio-demographic and clinical variables.

SI.NO.	Variables	Df	Chi- Square Value	P Value
1	Age	2	12.980	**0.021***
2	Gender	1	0.551	0.458
3	Religion	1	2.012	0.156
4	Education status	3	6.697	0.082
5	Occupation	4	14.602	**0.043***
6	Family monthly income	3	10.534	**0.015***
7	Marital status	1	0.044	0.834
8	History of alcoholism	1	4.657	**0.031***
9	History of smoking/tobacco chewing	1	0.298	0.585
10	Duration of illness	3	7.539	**0.048***
11	Grade of osteoarthritis	4	14.708	**0.015***
12	Level of pain	3	17.234	**0.001****
13	Type of knee osteoarthritis	1	10.381	**0.023***
14	Body mass index (BMI)	3	4.525	0.210
15	Presence of chronic illness (DM, HTN, HIV, Cancer, etc.)	1	0.002	0.964

*P<0.05 (Significant) Df – Degree of freedom

Findings related to the Association between Quality of life of patients with Knee osteoarthritis and their selected socio-demographic and clinical variables reveals that there was significant association was found

between Quality of life of knee osteoarthritis patients with their Age (χ^2=12.98, P<0.5), Occupation (χ^2=14.60, P<0.5), family monthly income (χ^2=10.53, P<0.5), History of alcoholism (χ^2=4.65, P<0.5), Duration of illness (χ^2=7.53, P<0.5), Grade of osteoarthritis (χ^2=14.70, P<0.5), Level of pain (χ^2=17.23, P<0.5), Type of knee osteoarthritis (unilateral) (χ^2=10.38, P<0.5).

DISCUSSION

The main objective of the study to find functional independence, quality of life and its clinical and psychosocial determinants among knee osteoarthritis patients. This cross-sectional study was included a sample of 100 patients of knee osteoarthritis attending selected orthopedic hospitals of Bagalkot. Findings revealed that, majority of (47%) of knee osteoarthritis patients had severe dependence. Similar findings were found in the study conducted by Silva, Edinilson & Molinari (2024) to assess the functional capacity among knee osteoarthritis patients at tertiary public hospital of Sao Paulo city in Brazil, had (68.3%) of severe dependence.[6] most of knee osteoarthritis patients (84%) good quality of life. most of knee osteoarthritis patients (95%) had clinically significant depression. Similar findings were found in the study conducted by Mahmoudi L, Sadati SM (2025) investigate the prevalence of major depressive disorder among elderly patients with osteoarthritis. Had (83%) had clinically significant depression.[7] most of knee osteoarthritis patients (39%) had high social support. Similar findings were found in the study conducted by Ilori T, Ladipo MM, Ogunbode AM, Obimakinde AM. perceived social support amongst patients in a family medicine clinic. Had (68.8%) had high social support.[8]

A functional independence and quality of life of knee osteoarthritis patients were positively correlated (r= 0.9881, P<0.01). Similar findings were found in the study conducted by the finding of the present study is supported with the study conducted by Araujo IL, Castro MC *et al.,* verify the association between functional independence and quality of life of knee osteoarthritis patients. Had (r=0.609, p<0.001) significant correlation was found between Functional independence and Quality of life of patients with knee osteoarthritis.[9]

A psychosocial determinant depression were negatively correlated with functional independence (r = -0.977), and quality of life (r = -0.963) of knee osteo arthritis patients. Similar findings were found in the study conducted by Kilinc H, Karahan S *et al.,*explore whether fear of movement, depression and functional performance are predictors of physical activity levels in patients with knee osteoarthritis had (r = – 0.429 P = 0.001) Negative correlation was found between Depression score and Functional independence.[10] And Similar findings were found in the study conducted by Siddiqui F, Tripathi N. had (r = – 0.34 P = 0.0001) Negative correlation between Depression score and Quality of life of patients with knee osteoarthritis.[11]

Social support were positively correlated with functional independence (r = 0.988) and quality of life (r = 0.963). Similar findings were found in the study conducted by M Hariprasath and C Yamuna had positive correlation was found between social support and Functional independence of patients with knee osteoarthritis (r = 0.298, P = 0.032).[12]

A significant association was found between Functional independence with socio-demographic and clinical variables of knee osteoarthritis patients with their Age (χ^2=15.52, P<0.5) and Occupation (χ^2=28.64, P<0.5), Similar findings were found in the study conducted by Dong, Y., Yan, Y., Zhou, J. *et al.,*to identify the risk factors for knee osteoarthritis in middle older aged (>40). age (1.02 [95% CI 1.01–1.03], $P = 0.007$) [13]. Similar findings were found in the study conducted by Kawano MM, Araújo IL *et al.,*to verify the association between functional independence and quality of life in patients with knee osteoarthritis. occupation ($P = 0.03$).[14]

A significant association was found between quality of life with socio-demographic and clinical variables of knee osteoarthritis patients with their Age (χ^2=12.98, P<0.5), Occupation (χ^2=14.60, P<0.5) and Level of pain (χ^2=17.23, P<0.5). Similar findings were found in the study conducted by Dong, Y., Yan, Y., Zhou, J. *et al.,*to identify the risk factors for knee osteoarthritis in middle older aged (>40). age (1.02 [95% CI 1.01–1.03], $P = 0.007$) [13]. a study conducted by Najim AAA, Faleh AAH, Noaman AAA. significant association was found between quality of life of knee osteoarthritis patients with their occupation (P = 0.0001).[15] and a study conducted by Núñez M, Núñez E, Segur JM, Maculé F, Sanchez A, Hernández MV, *et al.,* association was found between quality of life of knee osteoarthritis patients with their level of pain (P = 0.02).[16]

LIMITATIONS

The study is a preliminary study to assess the functional independence, depression, and social support affecting the quality-of-life patients with knee osteoarthritis. The limitations of this study include: Other socio-demographic and clinical factors have been included to find out association between functional independence, depression, and social support with quality of life of knee osteoarthritis patients. Some of the psychosocial problems like work environment and social status could have include to find out factors affecting quality of life of knee osteoarthritis patients. Small number of subjects limits the generalization of the study.

Recommendations

Interventions can be included to improve the quality of life of knee osteoarthritis patients. A similar study can be conducted with large sample size.

CONCLUSION

Overall study findings shows that a Grading of knee osteo arthritis i.e. grade: the functional independence and quality of life of knee osteoarthritis were positively correlated. depression were negatively correlated with both functional independence and quality of life of knee osteoarthritis patients. And social support were positively correlated with both functional independence and quality of life of knee osteoarthritis patients. A significant association was found between socio demographic and clinical characteristics (age, occupation, grade of osteoarthritis, and level of pain) and functional independence. A significant association was found between socio demographic and clinical characteristics (age, occupation, family monthly income, duration of illness, grade of osteoarthritis, and level of pain) and quality of life.

Ethical clearance

Ethical clearance was obtained from the institutional ethical committee of BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

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