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ORIGINAL ARTICLE

CORRELATION OF KNEE INJURY AND OSTEOARTHRITIS OUTCOME SCORES WITH ANTHROPOMETRIC MEASURE AND FLEXIBILITY IN SUBJECTS WITH OA KNEE

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P. Karthika[1], B. Divya[2]

Authors:
[1*]BPT Graduate, Faculty of Physiotherapy, Dr.MGR. Educational and Research Institute, Chennai, Tamil Nadu, India
[2]Lecturer, Faculty of Physiotherapy, Dr.MGR. Educational and Research Institute, Chennai, Tamil Nadu, India
Corresponding Author:
[*]BPT Graduate, Faculty of Physiotherapy, Dr.MGR. Educational and Research Institute, Chennai, Tamil Nadu, India, Email id: karthikapachiyappan30@gmail.com

ABSTRACT

Background of the study: Osteoarthritis knee is the most common joint disease that affects the aged people and result in long term disability. Osteoarthritis knee cause degenerative joint disease, wear and tear changes occurring in old age due to weight bearing and loss of articular cartilage. It occurs in 12.1% population approximately. Increased BMI is a well-recognized risk factor for radiographic knee osteoarthritis however, the contributions from joint mobility also have an impact on subjects with knee osteoarthritis. The objective of the study is to find out the correlation of knee injury and osteoarthritis outcome score (KOOS) with anthropometric measures and flexibility in subjects with Knee OA. **Methodology:** This is an observational study of analytical type, total of 100 subjects. 47 male and 53 female subjects aged above 55years with pre-diagnosed knee osteoarthritis were included for the study. Subjects with knee pain for last 3 months will be included in this study by convenient sampling method. Visual Analogue scale, knee injury and osteoarthritis outcome score (KOOS) questionnaire were used as an outcome measure, weighing scale, goniometer were the tools used for this study. The study was carried out at old aged home for 3 months. **Result:** A Positive Association and correlation between Knee ROM and Knee Injury and Osteoarthritis Outcome Score (KOOS) with Pearson value is 0.573 indicates an increase in KOOS score decreases knee range of motion in subjects with knee osteoarthritis. **Conclusion:** The study concluded that there is significant correlation with Knee injury and osteoarthritis outcome score (KOOS) and anthropometric measures in subjects with knee osteoarthritis.

Key Words: Osteoarthritis; Anthropometric measures; KOOS questionnaire.

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INTRODUCTION

Osteoarthritis is chronic musculoskeletal disorder and a leading cause of disability in the present world. Osteoarthritis, also known as degenerative joint disease, is the most common form of arthritis (Arthritis foundation,2014). Osteoarthritis (OA) is the most common form of degenerative joint disease affecting 15 to 40% of people aged 40 and above (Corti, M.C 2003). OA knee is one of the leading medical conditions in people above age 65 which leads to notable mobility impairment [1-3].

According to the World Health Organization (WHO), Osteoarthritis is the second commonest musculoskeletal problem in the world population(30%).The worldwide increase in the elderly population is the most important change as per the public health statistics for 21st century (Clary WAV 2004). It is being estimated that the number of people over the age of 65 can be doubled in the next 20 years [4-6].

Osteoarthritis (OA) and similar diseases that are more frequently encountered in advancing years become much more important from both medical and economic aspects (Lawrence RC 1998). A survey in India in 2011 revealed the OA prevalence rate of 32.6% in rural and 60.3% in urban population. OA was present in 50.2% population falling in age group 55-74 years 25% of women and 15% of men whereas it was 97.7% in age group 84 years or older (Sharma MK 2007). Socioeconomic impact of OA is greater than other diseases due to its higher prevalence [7-10].

Clinically, OA knee is characterized by pain during weight bearing, tenderness, and limitation of knee movement, crepitus, occasional effusion, and variable degrees of local inflammation. Pain is the most common reason for patients with OA which leads to social, psychological and economic burden. The patient has to seek medical attention and rehabilitation which may lead to financial consequences [11-14].

The radiographic hallmarks of primary Osteoarthritis include nonuniform joint space loss, osteophyte formation, cyst formation and subchondral sclerosis. Osteophytes which are formed are usually present at distal femur, proximal tibia and posterior to patella[15-17] .

Aim of the study: The aim of the study is to find that KOOS improve quality of life in geriatric population with osteoarthritis knee. Also to find out the effectiveness of BMI and KOOS in improving pain, functional ability and mental health in patients with knee osteoarthritis.

Need for the study: Knee pain in patient with osteoarthritis knee is a common clinical condition around the world. Ageing process is common in every people and due to ageing degenerative changes occurs in the human body. In other word cause of osteoarthritis knee pain is multifactorial. This study can prove the effect of special intervention on reduction of pain level at the knee joint, impairment and the level of risk factors and stress level on Improves physical health and maintenance of muscle strength around knee joint. Physical activity is the key element in prevention and management of knee osteoarthritis. The need of the study is to find out the effectiveness of KOOS questionnaire of knee and to improve the quality of life in the knee osteoarthritis patients.

Study design: It was Observational study design and Study type. Study setting was done at old age home Chennai, Sample size was 100

subjects (47 male and 53 female). Sampling method was Convenient sampling method. The study was conducted for a period 12 Weeks.

Inclusion criteria: Age above 55 years, Both male and female subjects, Radiographic confirmation of knee osteoarthritis, Patient body mass index (BMI). History of knee pain more than 3 months and Unilateral knee osteoarthitis.

Exclusion criteria: History of injuries and multiple falls, History of any recent knee surgeries, Patient with neurological disorders, Prolonged bed ridden subjects, Subjects with psychotic disorder, Subjects who are not wiiling to participate and Bilateral knee osteoarthitis.

Material used: Weighing scale, VAS (Visual Analogue scale), Goniometer and KOOS (Knee injury and osteoarthritis outcome score) questionnaire.

Procedure: Subject will be selected upon the selection criteria. A total of 100 subjects (both 47male and 53 female) were selected based on inclusion criteria. Informed conset was obtained prior to the study interview using questionnarie with the osteoarthritis knee patient. Subjects BMI was recorded. They were then provided with KOOS questionnaire and were made to fill in their responses as per given in the form. The results have analyzed statistically. The Knee injury and Osteoarthritis Outcome Score (KOOS) is a questionnaire designed to assess short and long-term patient-relevant outcomes following knee osteoarthritis. The KOOS is self-administered and assesses five outcomes: pain, symptoms, activities of daily living, sport and recreation function, and knee-related quality of life. The KOOS meets basic criteria of outcome measures and can be used to evaluate the course of knee osteoarthritis and treatment outcome. KOOS is patient-administered, the format is user-friendly and it takes about 10 minutes to fill out.

Scoring instructions: The KOOS's five patient-relevant dimensions are scored separately: Pain (nine items); Symptoms (seven items); ADL Function (17 items); Sport and Recreation Function (five items); Quality of Life (four items). A Likert scale is used and all items have five possible answer options scored from 0 (No problems) to 4 (Extreme problems) and each of the five scores is calculated as the sum of the items included.

Interpretation of scores: Scores are transformed to a 0–100 scale, with zero representing extreme knee problems and 100 representing no knee problems as common in orthopaedic scales and generic measures. Scores between 0 and 100 represent the percentage of total possible score achieved.

Anthropometric Characteristics of Subjects							
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**	
						Statistic	**Std. Error**
AGE	100	55.00	65.00	59.57	4.43871	3.321	.241
HEIGHT	100	137.00	170.00	153.91	7.19581	-.189	.241
WEIGHT	100	42.00	102.00	67.74	9.98749	.278	.241
BMI	100	18.20	38.90	23.94	4.38757	.978	.241

Table 1 Anthropometric Characteristics of Subjects

Descriptive Statistics for Dependent Variables							
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**	
						Statistic	**Std. Error**
Knee Flexion ROM	100	100.00	130.00	116.05	9.21941	-.217	.241
KOOS	100	11.21	48.66	28.73	7.14433	.221	.241
VAS	100	4.00	6.00	5.30	.62765	-.325	.241

Table 2. Descriptive Statistics for Dependent Variables, KOOS- Knee Injury and Osteoarthritis Outcome Score, VAS- Visual Analog Scale

Spearman's rho Correlations				
			AGE	**KOOS**
Spearman's Rho	AGE	Correlation Coefficient	1.000	-.085
		Sig. (2-tailed)	.	.403
		N	100	100
	KOOS	Correlation Coefficient	-.085	1.000
		Sig. (2-tailed)	.403	.0
		N	100	100

Table–3 Spearman's Rho Correlation of Coefficient between Age and Knee Injury and Osteoarthritis Outcome Score (KOOS), Significant level considered for P > 0.05

The above table reveals the Spearman's Correlation of coefficient Spearman's rho (rs) value and p-value between Age and Knee Injury and Osteoarthritis Outcome Score (KOOS)

The value of Spearman's rho (rs) is - 0.085 Although technically no association and correlation between Age and Knee Injury and Osteoarthritis Outcome Score (KOOS**).**

Spearman's rho Correlations				
			BMI	**KOOS**
Spearman's rho	BMI	Correlation Coefficient	1.000	-.597
		Sig. (2-tailed)	.	.000
		N	100	100
	KOOS	Correlation Coefficient	-.597	1.000
		Sig. (2-tailed)	.000	.0
		N	100	100

Table-4. Spearman's Rho Correlation of Coefficient between Body Mass Index (BMI) and Knee Injury and Osteoarthritis Outcome Score (KOOS), (P ≤ 0.05)

The above table reveals the Spearman's Correlation of coefficient Spearman's rho (rs) value and p-value between BMI and Knee Injury and Osteoarthritis Outcome Score (KOOS)

The value of Spearman's rho (rs) is - 0.597 Although technically a Strong Negative Monotonic Association and correlation between BMI and Knee Injury and Osteoarthritis Outcome Score (KOOS)

Parameters	Pearson correlation	
	'r' value	P value
Knee ROM & KOOS	0.573	≤ 0.05

Table-5 Pearson Correlation of Coefficient between Knee ROM and Knee Injury and Osteoarthritis Outcome Score (KOOS)

The above table reveals the Pearson Correlation of coefficient ' r ' value and p-value between Knee ROM and Knee Injury and Osteoarthritis Outcome Score (KOOS).

The value of R is 0.573 Although technically a Positive Association and correlation between Knee ROM and Knee Injury and Osteoarthritis Outcome Score (KOOS).

RESULTS

Result shows mean and standard deviation along with range of overall Knee Injury and Osteoarthritis Outcome Score (KOOS) with anthropometric measurements correlation in subjects with knee osteoarthritis.

The value of Spearman's rho (rs) is - 0.085 Although technically no association and correlation between Age and Knee Injury and Osteoarthritis Outcome Score (KOOS) in subjects with knee osteoarthritis.

Although technically a Strong Negative Monotonic Association and correlation between Body Mass Index & Knee Injury and Osteoarthritis Outcome Score (KOOS) with R value of Spearman's rho (rs) is - 0.597 indicates an increase in subjects Body Mass Index decreases the KOOS score with lower values representing extreme knee problem.

A Positive Association and correlation between Knee ROM and Knee Injury and Osteoarthritis Outcome Score (KOOS) with Pearson value is 0.573 indicates an increase in KOOS score decreases knee range of motion in subjects with knee osteoarthritis.

DISCUSSION

The purpose of the study is to find out the correlation between Knee injury and osteoarthritis outcome score (KOOS) questionnaire and anthropometric measurements in subjects with osteoarthritis knee.

Subject will be selected upon the selection criteria. A total of 100 subjects (both 47male and 53 female) were selected based on inclusion criteria Informed consent was obtained prior to the study interview using questionnaire with the osteoarthritis knee

patient. Subjects Body Mass Index (BMI) was recorded [18].

They were then provided with Knee injury and osteoarthritis outcome score (KOOS) questionnaire and were made to fill in their responses as per given in the form. The results were analyzed statistically [19].

After 3 months, statistical analysis revealed significant correlation between Knee injury and osteoarthritis outcome score (KOOS) questionnaire and Body Mass Index (BMI), thus favouring alternate hypothesis [20].

Studies suggest that the impact of obesity on knee osteoarthritis may be primarily through increased mass rather than through systemic or metabolic pathways associated with excess adiposity [21].

Similarly, data revealed no association and correlation between Age and Knee injury and osteoarthritis outcome score (KOOS). A trend for greater risk for knee osteoarthritis with increasing duration of being overweight was also found. Women consistently showed more risk for knee osteoarthritis from overweight than men [22].

So, in this study Body Mass Index (BMI) and Knee injury and osteoarthritis outcome score (KOOS) was improved, which improved functional performance in the patients with knee osteoarthritis. Obesity management plays a key role in preventive aspect of knee osteoarthritis. Results also revealed females are affected more when compared to males [23].

Clinical / structural osteoarthritis is high in subjects with high fat mass and fat % and was associated with clinical osteoarthritis in both men and women. Anxiety and depression are very common in patient with osteoarthritis. pain and depression forma various cycle. A total rehabilitation is the one which covers both physiological and psychological aspects that occur as a result of disorderb[24].

Thus, the study shows that by a high body mass index increases mechanical stress across kneejoint and increases pain status. On analysis of the effects of anthropometric measures on knee osteoarthritis, in all the subjects taken together, onlyBody Mass Index (BMI) and Knee injury and osteoarthritis outcome score (KOOS) was found to have a significant. Thus, KOOS and BMI have a strong correlation in quality of life in subjects with knee osteoarthritis [25].

Ethical clearance: Ethical clearance was obtained from the ethical Institutional Review Board of Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai with reference No: A28/PHYSIO/IRB/ 2018-2019 approval letter dated 17/01/2019.

Conflicts of Interest: There is no conflict of interest to conduct and publish this study.

Fund for the study: This is self-funded study, no fund received from any organization.

CONCLUSION

The study concluded that there is significant correlation with Knee injury and osteoarthritis outcome score (KOOS) and anthropometric measures in subjects with knee osteoarthritis.

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