CORRELATION OF FUNCTIONAL OUTCOME EVALUATION SCORE IN TOTAL KNEE ARTHROPLASTY PATIENTS

Thesis

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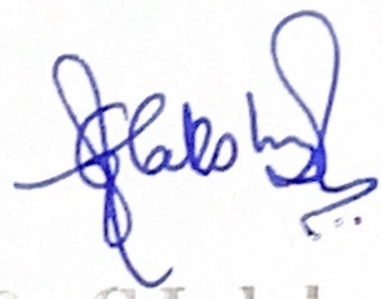
DECLARATION

I hereby declare that this thesis entitled "**CORRELATION OF FUNCTIONAL OUTCOME EVALUATION SCORES IN TOTAL KNEE ARTHROPLASTY PATIENTS**" is a bonafide and original research work carried out in partial fulfilment of the requirements for the degree of Masters of Surgery in Orthopedics under supervision and guidance, in the Department of Orthopedics Surgery, All India Institute of Medical Sciences, Jodhpur.

Date:



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CERTIFICATE

This is to certify that **DR. G Lakshmi Prasad** has satisfactorily completed his thesis entitled "**CORRELATION OF FUNCTIONAL OUTCOME EVALUATION SCORES IN TOTAL KNEE ARTHROPLASTY PATIENTS**" in partial fulfilment of the requirements for the Masters of Surgery in Orthopedics. He has done the research work under my supervision and guidance. He has fulfilled all the requisites under the regulations laid by the All India Institute of Medical Sciences, Jodhpur and no part of the thesis has been submitted to any other university.

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LIST OF ABBREVIATIONS

KSS	Knee Society Score
FJS 12	Forgotten Joint Score
PCS	Pain Catastrophizing scale
WHO-Qol	World Health Organisation-Quality of life
SF-36	Short Form 36
TKA	Total Knee Arthroplasty
VAS	Visual Analogue Scale
ROM	Range of motion
KL grading	Kellgren Lawrence grading
KOOS	Knee injury and Osteoarthritis Outcome Score

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SUMMARY OF THE PROJECT

Background: The purpose of this study is to perform a correlation of functional outcome scores in Total Knee Arthroplasty patients in a regional subset of patients presenting to the emergency of AIIMS Jodhpur.

Objectives: Finding the correlation between various scores and evaluating which score is better. Correlation of functional outcome score with VAS and ROM. Assessing FJS at 6 and 12 months and analysing the effectiveness of the score.

Methods: 96 patients who underwent TKA in AIIMS Jodhpur were called to OPD after 6 and 12 months for the evaluation of patient related outcomes. This questionnaire was given to them in the OPD to fill and again evaluated by the orthopaedician.

Results: Various functional outcome scores (KSS, PCS, FJS, WHO QOL and SF-36) were evaluated in patients undergone TKA after 6 months and 12 months in AIIMS Jodhpur .

Conclusion: No functional score is significant in assessing patients who underwent TKA.

No significant correlation was found between the functional outcome scores and VAS and ROM.

FJS is better evaluated at 12 months than at 6 months.

Introduction

INTRODUCTION

The distal femur, proximal tibia, and patella make up the knee joint. Menisci are fibrocartilaginous discs that expand the articulating surface between the femoral and tibial condyles. Menisci also relieve articular cartilage pressure. The anterior and posterior cruciates, the medial and lateral collaterals, the arcuate and oblique popliteal ligaments, and the arcuate and oblique popliteal ligaments are all ligaments found in the knee joint. The surrounding muscles, particularly the quadriceps anteriorly and the hamstrings and gastrocnemius posteriorly, help to stabilise and strengthen the knee joint. [1].

A combination of sliding, rolling, and rotation characterises knee joint movements. According to the curvature of the distal femoral condyles at the knee joint, the proximal tibial plateaus are not congruent. The medial condyle has a bigger articular surface than the lateral condyle. The articular cartilage of the lateral condyle, on the other hand, is wider than that of the medial condyle. The distal femoral condyle meets the tibial plateau like a wheel on a flat surface on the medial side. Like a wheel on a dome, the lateral distal femoral condyle meets the lateral proximal tibial plateau. This anatomical shape makes the joint more susceptible to degenerative conditions like osteoarthritis. [1].

Osteoarthritis is a degenerative and severe joint condition that affects many people [2]. Osteoarthritis is caused by repeated usage of a joint over a long period of time, resulting in wear and tear of the bone, joint, and articular cartilage [3]. Osteoarthritis is the most common arthritic illness, affecting more than 250 million individuals [2, or more than 10% of the world's population]. [4].

Knee joint osteoarthritis is the most frequent type of osteoarthritis [4, 5]. Knee osteoarthritis is becoming a more common public health problem because of an older population and a sedentary lifestyle that leads to an increase in body weight [9]. Osteoarthritis of the knee joint is also the most frequent chronic joint disease affecting the older population, with elderly women suffering from it at a higher rate. [5].

Osteoarthritis of the knee is the most common cause of chronic impairment in the elderly [6]. Physical handicap involving the lower extremity is more common in the

older age group due to this degenerative disorder than any other disease [7]. The most frequent joint condition presenting with clinical symptoms and impairment is osteoarthritis of the knee [8]. Osteoarthritis is expected to become the fourth biggest cause of disability in the near future due to its high incidence and ageing population [10].

CLASSIFICATION

The presence of joint pain and/or a reduction in the joint space between the articulating surfaces of the contributing bones, which is thought to be a result of thinning of the opposing articular cartilage, are used to diagnose knee joint osteoarthritis [8]. Standard weight-bearing radiographs are commonly used to assess knee osteoarthritis. The Kellegren and Lawrence grading system is used to assess osteoarthritis of the knee joint. WHO adopted this radiological classification in 1961 [1]. Knee osteoarthritis is graded on a scale of 0 to 4 according to this approach. The number '0' denotes the absence of osteoarthritis. The presence of doubtful or potential osteophytes without significant shortening of the joint space is classified as grade '1.' There are obvious osteophytes present in grade 2 with probable joint space constriction. The appearance of moderate numerous osteophytes, obvious joint space constriction, and some sclerosis indicate greater severity in grade '3.'The K-L grade is described in table 1.

Table 1: Kellegren-Lawrence classification of knee osteoarthritis.

K-L grade	Osteophytes	Joint space narrowing	Others
1	Possible	Normal	--
2	Definite	Possible	--
3	Moderate & multiple	Definite	Some sclerosis
4	Severe & multiple	Severe	Sclerosis & multiple cysts

In a nutshell, the existence of osteophytes in this classification system is critical. Recent research has emphasised the impact of characteristics such as joint space constriction, subchondral sclerosis, malalignment, marginal osteophytes, bone attrition, and tibial spine hypertrophy in addition to the presence of osteophytes [1].

Even though KL grading is most commonly used there are other classification systems. they are as follows-

1. Ahlbäck classification-

It mainly consists of 5 grades, they are

a) Joint space narrowing <3 mm(Grade1)

b) Joint space obliteration(Grade 2)

c) Bony attrition of <5 mm(Grade 3)

d) Bony attrition of 5-10 mm(Grade 4)

e) Bony attrition of >10 mm(Grade 5)

2.Modified Outerbridge scale of grading of osteoarthritis

Grade 0-Normal articular cartilage

Grade 1-Softening of articular cartilage

Grade 2-Fibrillation of cartilage

Grade 3-Deep fissuring of cartilage without exposed bone

Grade 4-Exposed bone

Malalignment is one of the most common characteristics of knee osteoarthritis, with varus deformity being the most common deformity [4]. Malalignment has also been identified as a significant risk factor for the advancement of knee osteoarthritis [12]. Under the subject of joint orientation angles, the influence of misalignment on knee osteoarthritis will be investigated.

Pain is the single most important clinical symptom for a knee osteoarthritis patient [13, 14], and it is this sensation that prompts the patient to seek medical advice. It's also true that the major goal of treating these patients is to minimise pain. While pain can occasionally be managed conservatively with analgesics and physiotherapy, pain is frequently the only symptom that leads to operational treatment, such as knee arthroplasty. The degree of pain in higher grades of knee osteoarthritis is usually greater, but there is a wide range of discordance between radiographic and clinical

knee osteoarthritis [15, 13]. As a result, a patient with relatively mild radiological knee osteoarthritis may appear with considerable pain and other clinical symptoms, necessitating intensive treatment, whereas a patient with end-stage knee osteoarthritis may be treated conservatively. As a result, treatment for knee osteoarthritis is tailored to the person, and the clinical functional condition of the knee must be examined in addition to the radiological findings. Knee function is hypothesised to be impaired in higher-grade osteoarthritic knees. Many functional knee scoring systems, such as the Knee Society Score (KSS), Oxford Knee Score (OKS), Knee Injury & Osteoarthritis Outcome (KOOS), etc., can be used to measure the functional status of the knee.

The most common cause of pain and disability in the aged population is knee osteoarthritis [15]. As a result, patients suffer functional limits [16], which obstructs everyday living and has a negative impact on psychological well-being, social connectivity, and overall quality of life [16, 17]. As a result, during the implementation of knee osteoarthritis care, quality of life is a powerful signal [16]. An attempt has also been made to investigate how knee osteoarthritis patients' quality of life is affected..

Patients with knee osteoarthritis frequently have psychological issues such as depressed symptoms and pain catastrophizing. Patients with osteoarthritis who are catastrophizers or have pain-related dread have been shown to have higher pain intensity and severe physical disability [5]. In addition, this has a negative impact on knee function and quality of life [14, 18]. Knee arthroplasty is a common and successful treatment option for advanced knee osteoarthritis patients who have a good outcome, although 20% of patients still have pain and disability six months after the procedure [19, 20]. Pain catastrophizing has been shown to be a powerful predictor of these negative consequences on its own [21]. On the contrary, there are studies that show no link between pain catastrophization and pain or knee function, leading to the debate [5].

PATHOPHYSIOLOGY

The pathophysiology of osteoarthritis is as follows

1. Genetic linkage of osteoarthritis –

a) Mutations in the COL2A1 gene (Type II procollagen) have been inflicted; however, mechanisms are not clear. Asporin gene (ASPN) has yielded significant interest. It codes for the small leucine-rich proteoglycan subfamily of proteins that binds to transforming growth factor-β (TGF-β) and to collagen and aggrecan. There is a functional link among ECM proteins, TGF-β activity, and disease. ASPN containing 14 aspartic acid repeats (D14) was significantly associated with osteoarthritis knee.

b) There is an imbalance between the catabolic and anabolic pathways of cartilage metabolism in osteoarthritis. Th e catabolic pathways are commonly associated with proinflammatory proteins, including IL-1β, tumour necrosis factor-β (TNF-β), IL-17, macrophage inflammatory protein-1β (MIP), etc. Proteinases (such as cysteine proteinases, metalloproteinases, and serine proteinases) are upregulated in response to stress on cartilage. Th ere is impairment of production of new extracellular matrix proteins by chondrocytes under the influence of cytokines while increased degradation of the products already present. Matrix metalloproteinases (MMPs) have been linked to development of osteoarthritis due to their effect on cartilage degradation. Members of MMP include ADAM and ADAMTS, a haplotype of the ADAM12 gene polymorphism is associated with osteoarthritis knee (sevenfold increased risk in females).

2.Trauma-

Traumatic injury and increased IL-1 stimulate chondrocytes to divide ("clone") and begin repair, producing more collagen and metalloproteinase proteoglycans. The increased proteoglycan accumulation causes cartilage thickening in the early stages of osteoarthritis, but the repaired tissue has qualitatively inferior Type 1 collagen and increased fibronectin. Patchy sclerosis and osteophytes, on the other hand, reduce bone elasticity, causing increased loads to be transferred to the cartilage and causing further damage. However, cartilage degrades over time as a result of ongoing cell damage and the release of cathepsins and metalloproteinases. Synovitis develops as a

result of degraded cartilage and bone, as well as soluble matrix proteins. Furthermore, as previously discussed, mechanical derangement is an important factor in the development of osteoarthritis, so trauma could have a significant impact in this regard. Meniscal and ACL structural integrity loss (with associated altered joint mechanics), joint incongruence, poor muscle strength, continued physical activity, and excessive biomechanical overload of the joint can all lead to the development of osteoarthritis after trauma or its residual effects. Cartilage damage can occur as a result of direct trauma in three ways: (1) cartilage disruption, (2) fracture along the tidemark, and (3) fracture through the calcified cartilage into subchondral bone (similar to an osteochondral lesion), all of which can progress to osteoarthritis over time. A previously injured knee has a fourfold increased risk of developing osteoarthritis. After obesity, trauma is the second most important modifiable risk factor for the development and progression of osteoarthritis.

3.**Metabolic changes-**

Metabolic changes in the synovial membrane lead to decreased concentration and viscosity of the synovial fluid and poor lubrication characteristics. Endogenous production of growth factors such as TGF-β and BMPs have been implicated in driving osteophyte formation and synovial thickening associated with osteoarthritis.

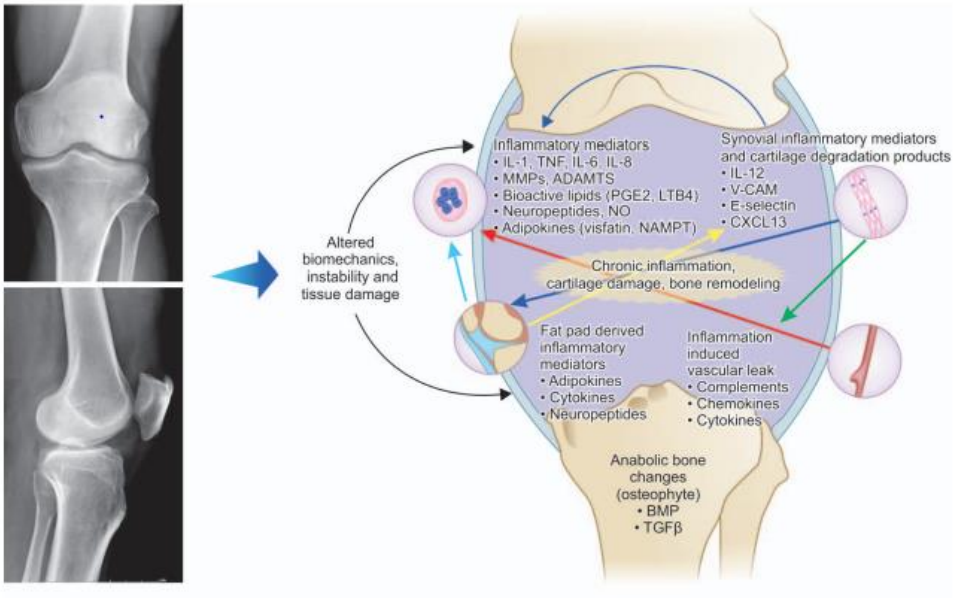

Fig 1 Pathophysisology of ostaearthritis knee.

MANGEMENT FOR OSTEOARTHRITIS

Osteoarthritis is mainly treated by conservative and operative management. In operative management is mainly done TKA. Some of the main indications of TKA is

1. Severe, refractory knee pain often at night

2.Difficulty with activities of daily living

3.Decreased mobility

4.Failure to respond to conservative measures.

TKA is one of the most commonly surgeries in the world. TKA mainly helps in relieving the pain of osteoarthritis of patients.

Rationale :

TKA is one of the most commonly done procedure for osteoarthritis of knee. In order to evaluate the patients who have undergone TKA various functional scores have been described but none really have evaluated a patient completely post operatively. Multiples score have been used in evaluation but none was effective single handedly albeit a combination of scores was found to be effective.

Aim and Objectives

AIM AND OBJECTIVES

Aim-To study the correlation of functional knee outcome scores in patients who underwent TKA.

Objectives

1. Comparing the correlation between the different functional outcome evaluation scores of the knee in patients who have undergone TKA for severe OA knees at least 6 months prior to date of assessment
2. Comparing the correlation between the different functional outcome evaluation tools and the clinical condition of the patient as evidenced by the VAS and ROM of the knee in patients who have undergone TKA for severe OA knees at least 6 months prior to date of assessment and
3. Comparing Forgotten Joint Score (FJS) at 6 months and 12 months in post TKA patients and assessing the effectiveness of FJS.

WHAT DOES MY STUDY ADD

1. Will help in comparing 6 different types of scores in post TKA patients and observe its correlation and the same functional scores with clinical function post TKA as measured by Visual Analog Score (VAS) and Range of Motion (ROM).
2. Assess if the state of complete normalcy after having undergone a major surgery, TKA as evaluated by the Forgotten Joint Score is achieved by 6 months or 1 year post TKA.

RESEARCH QUESTION

Research question

Is there a correlation between the various scores (WHOQOL, SF-36, PCS, KSS and FJS), comparing same functional outcome scores with clinical condition of the patients as evidenced by VAS and ROM of the knee in patients who underwent Total Knee Replacement at least 6 months prior to assessment?

Research hypothesis

Analysing various patient related outcome evaluation scores in patients who underwent TKA at least 6 months prior to assessment to observe for any correlation between the scores and comparing the same functional scores with clinical parameters viz. VAS score and ROM of the knee. Comparing FJS at 6 and 12 months after TKA and assessing the correct time to calculate FJS.

Null hypothesis

There is no correlation between patient related outcome evaluation scores and same patient related outcome scores with the clinical condition of the patient as evidenced by VAS and Knee ROM

Alternative hypothesis

There is significant correlation between patient related outcome evaluation scores and same patient related outcomes scores with the clinical condition of the patient as evidenced by VAS and Knee ROM.

List of variables and their measurement methods with standardization techniques

Outcome variables

1) Relation between functional scores and quality of life in patients who underwent total knee replacement 6 months ago.

Confounding factors

1) Two points of contact with patient.

Review Of Literature

REVIEW OF LITERATURE

Osteoarthritis of knee, being a degenerative disease, age is considered to be the primary risk factor for developing this condition [9].

In United States osteoarthritis is considered to be a leading cause of disability; and among them knee osteoarthritis is recognized as the commonest manifestation. It is also reported that, prevalence of knee osteoarthritis increases with the increase in the age group. The above statement is evidenced by evaluating the population of United States. When people of ≥25 years age group is evaluated, only 13.9% is affected with knee osteoarthritis; whereas the proportion of affected magnifies up to 33.6% when the age of evaluated population group is >65 years [10].

Subjects more than 65 years of age presenting with chronic knee pain were investigated with radiographic imaging. 480 of such subjects were included in a longitudinal study by Miller *et al.* (2001). During evaluation of the radiographic images, they affirmed 51.6% of radiological knee osteoarthritis among all presenting with chronic knee pain beyond the age of 65 years [6].

During analysis of Johnston County Osteoarthritis Cohort, Jordon *et al.* (2007) also assessed for prevalence of knee osteoarthritis. They investigated the knee joints via radiographs & found a significant difference in prevalence among different age group. They reported a prevalence of 26.2% while evaluating age group of 55 – 64 years, which shoots up to about 50% in more than 75 years of age. They also reported a similar increase in the prevalence of symptomatic knee osteoarthritis from 16.3% to 32.8% in the respective age group [11].

Increasing prevalence of knee osteoarthritis throughout the years of elderly age was documented during 18th biennial examination of the Framingham heart study. A total of 1424 knee radiographs were evaluated by a single radiologist. Evidence of radiographic knee osteoarthritis was found in only 27% among subjects younger than 70 years, which rose up to 44% in subjects older than 80 years and shoots up to 51% in more than 85 years age group. Regarding moderate to severe osteoarthritis knee (KL grade 3 & 4), the prevalence increases from 11% in the 65 – 69 years age group to 25% in those aged more than 85 years. They also reported an infinitesimal higher prevalence of radiographic knee osteoarthritis in women (34%) than in men (31%).

However, there was a pronounced proportion of symptomatic disease in 11% of women at variance with 7% of men [8].

At an interval of 7 years the above population was re-evaluated and 82.7% of previous study population participated. Felson *et al.* (1995) found, age not to be a significant predictor of incidence, progression or contralateral knee osteoarthritis in men or women or analyzing with combined sexes. According to their report, more than or less than 70 years age, regardless of that, cumulative incidence was similar in both groups [7].

KSS

Knee arthroplasty, both complete and partial, is performed all over the world. Nonetheless, the original score's reliability, responsiveness, and validity have been put to the test. Furthermore, it became evident over time that the original Knee Society Clinical Rating System had ambiguities and flaws that needed to be addressed its applicability and validity in today's patients.

Expectations, goals, and functional requirements are frequently different from those of previous generations of employees who have had knee arthroplasty.

Both doctors and patients collaborated to create the new Knee Society Knee Scoring System. It is available in both preoperative and postoperative versions. The surgeon's objective knee score includes a VAS score for discomfort while walking on flat ground, stairs, or inclines, as well as an examination of alignment, ligament stability, and range of motion. There are also deductions for flexion contracture and extensor lag. Following that, the patients' happiness, functional activities, and expectations are recorded. Given the diverse activity profiles of many modern patients, the functional component of the score was improved to include a patient-specific survey, which evaluates features such as standard activities of daily living, patient-specific sports and recreational activities, patient satisfaction, and patient expectations. Parts of the original Knee Society Clinical Rating System have been incorporated into the new version to preserve the integrity of the previous edition of the Knee Society score.

WHY IS IT IMPORTANT?

Three parameters are evaluated by the rating system: pain, stability, and range of motion. This solves the problem of patient infirmity resulting in deteriorating knee scores.

Many grading systems have been used in the past to evaluate TKA outcomes. The Knee Society aimed to standardise outcome metrics so that patients' and prosthesis' outcomes could be compared across different centres.

It has become the most widely used tracking and reporting mechanism.

STRENGTHS

1. The Knee Society Clinical Rating System included separate scales for knee rating and functional evaluation to eliminate the deteriorating ratings associated with patient infirmity linked to integrated functional and joint related features.

It has been demonstrated that the grading system is responsive to alterations following total knee replacement surgery [15].

2. To eliminate the deteriorating ratings associated with patient infirmity linked with integrated functional and joint related characteristics, the Knee Society Clinical Rating System comprised distinct scales for knee rating and functional assessment.

WEAKNESSES

1. For both the knee and function scores, there was a lot of inter-rater variability, which was influenced by the rater's expertise.
2. Data are subject to researcher bias due to the architecture of the physician-administered Knee Society Rating System. Typically, a member of the surgical team would fill out the form, which could contribute to bias because they want to demonstrate the success of their surgical intervention. There are also recognised discrepancies in how patients and physicians rate pain, making direct comparisons between the Knee Society Clinical Rating System and patient-administered surveys like the WOMAC and SF-36 challenging.

The KSS is a knee joint-specific questionnaire that was developed and validated in 1989 for use in evaluating the outcome of total knee replacement [16]. The KSS consists of two parts: a knee rating (0–100 points) and a function (0–100 points) worth a total of 200 points. The knee rating is divided into two parts: pain (0–50 points) and a knee score (0–50 points) that evaluates range of motion, stability, and alignment. A higher score indicates a more favourable outcome. The Knee Society Score (KSS) is freely available at http://www.kneesociety.org/web/index.html and is widely used in outcome studies for partial and total knee replacement. Some authors [17–19] have questioned the validity of the scoring system as a "clinician completed" system. In response to these criticisms, a revised knee society scoring system (2011-KS Score) for measuring outcomes in TKR was recently developed [20] and validated [21].

The function score includes a walking component that is worth 50 points, although unlimited walking is only worth 40 points. One point is awarded for every 5° of knee flexion in the original range of motion system (maximum 125° and 25 points). One point is granted for 8° in the modified form of 1993. Thus, a patient would need to display an unattainable knee flexion range of motion of 200° to receive the maximum score of 25 points.

The Knee Society Clinical Rating System, despite providing legitimate knee and functional parameters, does not provide any indication of patient quality of life or satisfaction with the surgical intervention. It is critical that these measurements be obtained in a variety of situations. Additional patient-reported questionnaires would be required in this case.

FORGOTTEN JOINT SCORE

The Oxford knee score (OKS) is a scoring system that has been regularly verified in TKA research However, the OKS has been proven to have a significant ceiling effect in recent years (making it less ideal for examining potentially tiny variations in knee function in patients with good or great clinical results following TKA.[22]

A new scoring system, the forgotten joint score (FJS), was recently designed to solve this issue (Behrend et al. 2012). The FJS score system is based on a 12-item questionnaire that asks patients about their ability to forget about their artificial joint

in everyday life (i.e., lack of awareness of the knee), which is the ultimate goal after arthroplasty. Earlier research (Behrend et al. 2012, Thienpont et al. 2014, Thompson et al. 2015) established a strong connection between the FJS and other PROMs (WOMAC and KOOS) and demonstrated that the FJS has potential ability to evaluate outcome. The relationship between the FJS and the OKS has never been studied before.[22]

Behrend et al. created the Forgotten Joint Score (FJS) in 2007. This new PROM assesses a highly tempting concept: a patient's ability to forget about their artificial joint in daily life. 4 The best outcome after a complete knee or total hip replacement, according to Behrend et al, is the goal of a total hip replacement (TKR/THR) was for the patient to be "unaware" that they had one a prosthetic joint was used. The best outcome after a complete knee or total hip replacement, according to Behrend et al, is the goal of a total hip replacement (TKR/THR) was for the patient to be "unaware" that they had one a prosthetic joint was used. The best outcome after a complete knee or total hip replacement, according to Behrend et al, is the goal of a total hip replacement (TKR/THR) was for the patient to be "unaware" that they had one a prosthetic joint was used. The best outcome after a complete knee or total hip replacement, according to Behrend et al, is the goal of a total hip replacement (TKR/THR) was for the patient to be "unaware" that they had one a prosthetic joint was used. [22]

The Forgotten Joint Score (FJS) is a scoring system that was established in recent years and is based on 12-question surveys to determine a patient's capacity to forget their artificial knee joint in daily life. The greater the score, from 0 to 100, the more natural or "forgotten" the joint is. In addition, unlike other patient-reported outcome measures, FJS is not constrained by the ceiling effect6. The FJS has been utilised widely in patients who have had total hip and total knee arthroplasty (TKA)

The FJS-12 is a 12-question survey with a 5-point Likert response format and raw results translated onto a 0–100 point scale. Higher scores imply a better outcome, such as a more natural-looking prosthetic joint. The FJS-12 has a modest ceiling effect and can distinguish between good, very good, and outstanding outcomes following joint arthroplasty.[23]

The validity and responsiveness of a Danish version of the FJS, as well as its connection with the OKS and test-retest features, were explored. The OKS was chosen for study because Dunbar et al. (2001) discovered that it was the most appropriate disease-specific PROM to employ when evaluating the outcome of TKA. [24]

STUDY

Randomly chose 360 patients who had a primary unilateral TKA at our institution (Copenhagen University Hospital, Hvidovre, Denmark) between January 2010 and January 2013 for a retrospective cross-sectional survey. They had never had open knee surgery before and did not require revision surgery after main TKA.

Patients were treated with a cemented previous-generation fixed-bearing, cruciate retaining TKA (AGC; Biomet, Warsaw, IN), a cemented newer-generation fixed-bearing, cruciate retaining TKA (Vanguard CR; Biomet), or an uncemented, mobile-bearing, cruciate retaining TKA (Vanguard CR; Biomet) (Vanguard ROCC; Biomet). Emerson et al. 2000, Worland et al. 2002, Ritter 2009, Stormont and Chillag 2009, Bercovy et al. 2012, Thomsen et al. 2013, Atrey et al. 2014, Kievit et al. 2014, Schroer et al. 2014) have all showed good clinical results.

The FJS is a 12-item survey that asks people about their awareness of their artificial joint during ADL. Table 1 lists the questions that were included in the FJS survey. The participant can choose from six response alternatives for each question: never, almost never, seldom, occasionally, mostly, or not relevant for me.

When calculating the total score for the FJS, all responses are added together (never, 0 points; almost never, 1 point; rarely, 2 points; occasionally, 3 points; mostly, 4 points) and divided by the number of completed items (questions marked "not relevant for me" were treated as missing values and were not included in completed items). After multiplying this average by 25, a total score range of 0 to 100 is obtained. Finally, the score is reduced from 100 to change the final score's orientation, so that high scores indicate a high degree of "forgetting" the prosthetic joint—that is, a low level of awareness. If there are more than four "not relevant for me" or "missing" responses, the overall score will be zero. [22]

The OKS is a 12-item questionnaire-based PROM that has been previously validated. It is commonly used to assess the outcome of TKA. Participants can receive a total score ranging from 0 to 48, with 48 being the greatest possible result. The mean value representing all of their other responses is utilised in the case of missing responses. The overall score should be eliminated if more than two responses are missing.

Patients must be able to "forget" their artificial knee if it is pain-free, has an appropriate range of motion, and provides stability in all degrees of flexion during ADL. All of these criteria are taken into account by the FJS when assessing the outcome of TKA. The purpose of this study was to look at the validity and reliability of the FJS.

The FJS questionnaire was translated from English to Danish using methods that are widely acknowledged around the world. As a result, we consider that the Danish version of the FJS questionnaire is a good representation of the original questionnaire and that it can be utilised in TKA outcome research.

In conclusion, the FJS had strong concept validity, related to the OKS, and had good test-retest reliability when used in groups. The ceiling effect of the FJS was lower than that of the OKS. Rephrasing items 4 and 8 and considering item weighting or excluding item 2 are suggestions for improving the FJS score. The FJS appears to be a promising instrument for assessing minor changes in knee performance in groups of individuals who had good or exceptional clinical outcomes following TKA.[25]

VAS

Visual analogue scale (VAS) is a reliable, valid, responsible, widely used unidimensional pain outcome measure, consisting of a bi-directional straight line of 10 cm length ranging from “no pain” to “worst possible pain” marked at either end. For assessment of pain through this scale patients are asked to mark a vertical stroke on the line, representing their level of pain [26]. In VAS a score of 3.0 corresponds with moderate pain and score ≥ 5.4 corresponds with severe pain [27].

Visual analogue scale (VAS) is a unidimensional pain scale for assessing pain intensity. Some other recommended scales are Numerical rating scale (NRS), Verbal rating scale (VRS). In a systemic review the above three scales were compared and NRS was found to be easy and had higher compliance.[27,28]

Between the other two, VAS score corresponded with NRS, but VRS scores were highly variable with respect to NRS [25, 26].

Pain is the primary reason for surgical treatment of knee osteoarthritis (OA). 1-3 Pain, on the other hand, is difficult to assess in a reliable and reproducible manner, as evidenced by the numerous pain scoring systems available. 4 There are also specific scores for different joints that assess the outcome of OA surgery based on variables such as pain, function, and quality of life. Pain, on the other hand, is the primary outcome measure for a patient. In clinical research, there is a need for a widely accepted, yet simple and reliable method of assessing joint pain, and in basic research aimed at identifying and quantifying any nociceptive mediators underlying joint pain, tissue levels of these mediators could be related to the degree and type of pain.

STUDY

The study included 69 Caucasian Swedish patients who were scheduled for TKR for OA. The study was approved by the Karolinska Hospital's ethical committee. A power analysis revealed that 28 patients were required to demonstrate a strong relationship ($r = 0.50$) with a level of significance of 5% and a power of 80% when using a two-tailed test. Our 69-patient sample size allowed for the analysis of subgroups, which we did not do. There were 34 men and 35 women in attendance, with a mean age of 68 years (40 to 80). The average length of time for knee pain was 8.5 years (1 to 25). Prior to surgery, no patient had a clinical history of drug abuse or was taking opioid drugs.

To assess patient satisfaction with the TKA at follow-up, a satisfaction VAS system, similar to the system used to measure pain, was developed [29,30]. The scale was a horizontal line 100 mm long that ranged from completely satisfied to completely unsatisfied. The question "Are you happy with your knee prosthesis?" was at the top of the scale. Facial expressions were placed above the line to visually express satisfaction. This scale was mailed to all patients, who were asked to mark the line at the point that best reflected their level of satisfaction. Using a ruler, the number of millimetres was measured and converted to points. The sense of accomplishment The VAS system used a scale of 0 (worst, completely dissatisfied) to 100 (best, completely satisfied) (best, completely satisfied). The patients did not express whether they were satisfied or dissatisfied with the services they received.

Numerous studies have shown that VAS scores are reproducible, valid, quick, and reliable [29,30]. The VAS score for satisfaction has been used to evaluate hip arthroplasty and has proven to be a useful tool [31]. We were unable to locate any reports of the VAS being used to assess TKA. Patient satisfaction is an important factor in TKA, and we used it as a survival endpoint in our study. It appears that 73 percent of patients have a satisfactory outcome 5 years after TKA.

SF-36

The Medical Outcomes Study 36-Item Short Form (SF-36) is a widely used method in orthopaedics for assessing health-related quality of life (HRQOL) [32]. It has been identified as a valid and reliable generic measure of functional status, well-being, and overall health perception. Its generic nature allows it to be used to compare the relative value of various surgical interventions.

The goal of this study was to use a generic health outcome measure called the SF-36 on elderly patients to assess the relative efficacy of primary total hip and knee arthroplasty based on their self-assessed health care outcomes.

STUDY

The study included 144 patients who had total hip or knee cement endoprostheses implanted at the Clinic for Orthopaedic Surgery Lovran. Highly experienced surgeons performed the operations under identical working conditions, using standard surgical procedures. For patients with hip and knee arthritis, the indications for surgery were severe and intolerable pain and dysfunction. Patients who underwent second joint arthroplasty during the study period were excluded. The patients were prescribed the appropriate physical therapy programme during their post-operative period. In the 74 cases of primary total hip arthroplasty, the preoperative diagnosis was osteoarthritis in 67, posttraumatic arthritis in 4, avascular necrosis in two, and rheumatoid arthritis in one. The preoperative diagnosis in the 70 cases of primary total knee arthroplasty was osteoarthritis in 65, posttraumatic arthritis in three, and rheumatoid arthritis in two.[33]

The survey of the impact of primary total knee arthroplasty on patients' overall health perception found that HRQOL improved after surgery as well.

Physical function, role limitations due to physical problems, social function, energy or vitality, pain, general health perception, and role limitations due to emotional problems all showed statistically significant improvement (p0.001). There were no statistically significant differences at the level of mental health assessment.

The survey of the impact of primary total knee arthroplasty on patients' overall health perception found that QOL improved after the surgery.

Physical function, role limitations due to physical problems, social function, energy or vitality, pain, general health perception, and role limitations due to emotional problems all improved statistically (p0.001). At the level of mental health assessment, there were no statistically significant differences.

Physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health are the eight scales measured by the SF-36 (MH). The SF-36 measures two distinct concepts, according to component analyses: a physical dimension represented by the Physical Component Summary (PCS) and a mental dimension represented by the Mental Component Summary (MCS) (MCS). In varying proportions, all scales contribute to the scoring of both PCS and MCS measures. 3 The correct calculation of SF-36 summary measures PCS and MCS requires the use of proprietary algorithms strictly regulated by a private company. [34]

The SF-36 questionnaire was designed to assess two distinct constructs of health-related quality of life: physical and mental. After an extensive and sophisticated validation process, the SF-36 developers concluded at the end of the 1990s that their questionnaire was adequate for measuring these two constructs of health-related quality of life. [32] They never proposed, and in fact were opposed to, using the SF-36 to create a single index of health-related quality of life.

Following that, dimensionality analyses of the SF-36 in general populations confirmed the extraction of these two main factors (Physical and Mental)[35,36]

SF-36 is most widely used as general health status or quality of life assessing tool, even in knee osteoarthritis patients. Pereira *et al.* (2016) examined 676 patients of knee and hip osteoarthritis to find out the relation between radiographic osteoarthritis features and quality of life. Among the whole study population 48.6% were affected

with only knee osteoarthritis (K-L grade ≥ 2). Here quality of life was assessed with SF-36 questionnaire. As a result they found that, increasing severity of radiographic knee osteoarthritis was significantly associated with reduced physical function, role-physical, bodily pain and general health [37].

STRENGTHS AND LIMITATIONS

This review was limited because the queries "SF-36 total score," "SF-36 global score," and "SF-36 overall score" were not indexed in all of the databases we used. This could explain why fewer articles are retrieved from these databases when compared to the number of articles obtained by consulting article references or searching the Internet. Another limitation is that our study was restricted to only five databases. Despite these constraints, our review discovered a significant number of studies that addressed the SF-36 Total/Global/Overall Score.[38]

The SF-36 questionnaire has proven to be a useful and accurate tool for assessing the impact of these surgical procedures on HRQOL. We believe that the SF-36 questionnaire's structure is appropriate for assessing outcomes after these surgical procedures, which are primarily aimed at reducing pain and allowing patients to move more freely. It can be concluded that total hip or knee arthroplasty significantly improves the HRQOL of elderly patients. HRQOL appears to be slightly better in patients who have had total hip arthroplasty.

Pain catastrophizing score

Psychological impairments are common in knee osteoarthritis patients and may incorporate depressive symptoms, increased pain catastrophizing [39.]. Pain catastrophizing has been widely perceived as an excessive adverse mental set applied during actual or anticipated pain experiences. Previously pain catastrophizing was thought to be associated only with pain severity, emotional distress and pain related disability. But recent studies documented association with functional decline and quality of life in patients with chronic pain, such as knee osteoarthritis [40]. Pain catastrophizing may also result in activity avoidance, which may further affect the quality of life [39.].

Pain catastrophizing is assessed using Pain Catastrophizing Scale (PCS) [39,40,41,42,43,44] which is a self-reported questionnaire [39,43] dealing with

negative thoughts and feelings related to experience of pain [43]. PCS covers three different dimensions of pain catastrophizing: rumination, magnification & helplessness. This questionnaire consists of 13 items, asking the patients to rate the level at which they feel the listed thoughts on a five point Likert scale, ranging from '0' (not at all) to '4' (all the time). The total score ranges from 0 to 52; higher the score, greater the pain catastrophizing. A total PCS score ≥ 30 corresponds to a clinically concerned level of catastrophizing, which may significantly alter the quality of life, functional status of knee or symptomatic pain in knee osteoarthritis patients. PCS scores may also be affected by race and gender [46]. In a systemic review, PCS scores of people of Germany, Australia, China & Japan were respectively 11.9, 19.0, 33.7 & 33.5. Sullivan *et al.* (2019) documented mean PCS score of 19.5 (SD 8.5) among women, which was higher than men (mean 16.4, SD 7.3), indicating increased catastrophising among women. They also defined people with PCS score > 24 as 'catastrophisers' and PCS score < 15 as 'non-catastrophisers'.

VARIOUS DETERMINANTS OF PAIN CATASTROPHISING

1.Gender

2.Race

3.Age

4.Genetic susceptibility

5.Neurophysiological studies

6.Psychological

End-stage osteoarthritis is commonly treated with bicondylar total knee replacement (TKR).

After uncomplicated TKR, a high prevalence of residual pain has been reported, particularly during the first year [47,48,49,50,51]. According to Forsythe et al. [50], the pain level at 3 and 12 months postoperatively was still approximately 50% of the preoperative pain level. Brander et al. [51,52] found that the mean pain level measured on a visual analogue scale was 52 before surgery, 25 three months later, and 17 a year later.

Modifiable and non-modifiable parameters can be used to predict postoperative discomfort following TKR [47,53]

Young age, female sex, and severe preoperative discomfort are non-modifiable predictors [49,51]. Modifiable psychological variables are of clinical interest. Psychopathologic distress has been linked to poor patient outcomes following surgery in several studies [54,55]. Furthermore, depression and somatization dysfunction have been linked to protracted pain following TKR . Anxiety and pain catastrophizing are two other psychological determinants of postoperative pain [56,57]. The impact of anxiety on the intensity of postoperative pain is debatable [58].

STUDY

In 2012 and 2013, patients were recruited. Patients who were eligible for this prospective trial were identified using a number of inclusion and exclusion criteria.

Inclusion criteria

Primary TKR with implantation of a cruciate-retaining bicondylar prosthesis to treat osteoarthritis.

Few studies have looked at how pain catastrophizing affects TKR outcomes. Pain catastrophizing was associated with significantly higher pain levels and lower knee function (KOOS) at baseline and 6 months postoperatively in the current study. Patients with anxiety were significantly more dissatisfied at 6 months postoperatively. The differences were assimilated 12 months after surgery. Apparently, real clinical knee pain prior to surgery and the healing process immediately following implantation play a significant role in pain catastrophizing.

Patients who catastrophized their pain had a 1.73-fold higher risk of dissatisfaction 12 months after TKR than patients who did not catastrophize their pain. Catastrophizing, according to Keefe et al. [59], results in altered central nervous system pain processing, increased healthcare claims, and decreased function.

Forsythe et al. [50] demonstrated that a high preoperative PCS level is a predictor of persistent knee pain as measured by the McGill Pain Questionnaire (MPQ) at 12 and 24 months.

Forsythe et al. [50] demonstrated that a high preoperative PCS level predicts persistent knee pain as measured by the McGill Pain Questionnaire (MPQ) 12 and 24 months after TKR. They also discovered that the PCS's psychological variable did not change significantly following TKR. This study could not confirm that the "rumination" component of the PCS is a better predictor than the entire PCS. In a review, Bonnin et al. [48] identified pain catastrophizing as one of five predictors of persistent knee pain after TKR. Riddle et al. [60] discovered that the WOMAC pain score had a significant influence 6 months after surgery. The disparities may be explained in part by the short study periods and different PCS cut-off points (15 or 30 points) between studies. Investigations, particularly those conducted within the last 12 months, reveal a greater influence.

Pain catastrophizing, according to Wallis and Tayler [61], is modifiable. Coping skills, improved preoperative knowledge of outcomes, and participation in decision-making are all possible interventions [62]. Sensory training during rehabilitation, according to Hirikawa et al. [63], can reduce persistent pain. The current study emphasises the need for intervention.

Finally, anxiety, particularly pain catastrophizing, can have a significant impact on outcomes following TKR. However, when compared to the influence of somatization and depressive symptoms [47], the impact appears to be slightly lower.

Although more well-controlled and large-scale data would be useful, the current evidence suggests that pain catastrophizing is a risk factor for chronic pain after TKA surgery. Given that pain catastrophizing is a modifiable response to threat in other populations of chronic pain patients(38–400) and that it is a causal risk factor, interventions aimed at reducing pain catastrophizing symptoms may translate to improved TKA pain outcomes. As the ageing population and rising obesity epidemic drive up TKA rates,1,3 further clarification of the prognostic value of various pain catastrophizing levels holds promise for closing the gap in TKA recovery outcomes.

WHO Quality of life

Knee osteoarthritis being a prevalent form of chronic joint disease associated with functional restrictions and pain, has a significant impact on quality of life. Patients with knee osteoarthritis has reduced quality of life due to adversely affected social connectedness and psychological well being by limited activity level caused by the disease process. In addition to the structural and functional limitations caused by knee osteoarthritis, pain and disability from knee osteoarthritis also inversely affects social connectedness, relationships and emotional well being, further reduces the quality of life [64.]. The management of knee osteoarthritis is focused on optimizing the patient's quality of life and the term 'Quality of life' refers to the general well being of individuals and societies [17]. Commonly used tools for assessment of quality of life are Short Form – 36 (SF-36) & WHO – Quality of Life (WHOQoL) questionnaires. It is documented that gender affects quality of life in knee osteoarthritis patients, females are reported to have worse quality of life than males [16].

COMPONENTS OF WHOQOL

The WHOQoL-Bref was developed comprising four domains of quality of life: physical, psychological, social and environmental. They are scaled in a positive direction, so that higher score indicates better quality of life [65.] It is self administered by the respondents, but an experienced investigator may help by reading the questions loudly where the patient is illiterate or disabled. The WHOQoL is also documented to be sound and cross-sectionally valid. The correlation between different domains of WHOQoL were very strong, positive and significant P-value <0.001)
[17].

The WHOQOL-100 includes 24 facets that are universally regarded as important in assessing quality of life by all 15 field centres, as well as four general questions that address overall quality of life and health. There are four questions for each facet. According to a recent data analysis, these 24 facets can be most appropriately classified into four domains: physical, psychological, social relationships, and environment.

At a conceptual level, the WHOQOL Group agreed that any abbreviated version of the WHOQOL-100 should maintain comprehensiveness by including at least one question from each of the 24 quality of life facets. The following criteria were used to make decisions about which items to include in the WHOQOL-BREF. I The items chosen to represent a specific domain should explain a significant proportion of the variance within that domain. (ii) Included items should explain a significant proportion of variance in the general facet relating to Overall Quality of Life and General Health perceptions. (iii) In terms of confirmatory factor analysis, the final assessment should demonstrate structural integrity. (iv) The final evaluation should be able to distinguish between identified groups of subjects (i.e. ill versus well subjects)

Methodology

METHODOLOGY

Study design

It is a prospective cross-sectional study. The study was designed and supervised and conducted by the Department of Orthopaedics, AIIMS Jodhpur and reviewed by the Research section, AIIMS Jodhpur. The study was conducted as per the Declaration of Helsinki and Good Clinical Practices guidelines. Institutional ethical committee approval was taken (AIIMS/IEC/2019-20/967). Study is conducted from 1st January 2020 to 1st March 2021.

Written informed consent was taken from all the eligible patients as the regulatory criteria for inclusion in the study.

Inclusion criteria

1. Patients undergoing primary total knee replacement for osteoarthritis of knee.

Exclusion criteria

1. Patients with severe degenerative spine disease & osteoarthritis hip on X-ray of spine and patients with previous known / documented history of degenerative spine disease & osteoarthritis of hip.
2. Active infection of knee or anywhere in the body, revision arthroplasty, vascular problems (deep vein thrombosis), having periprosthetic fracture, previous implant in knee joint, secondary osteoarthritis-post traumatic/post inflammatory/post infection, patients not consenting for the study.

STUDY PROCEDURE AND DATA COLLECTION METHODS:

The patients attending AIIMS Jodhpur OPD between January 2020 and March 2021 were evaluated by taking a clinical history and a thorough physical examination was performed. Clinical history included side involved how painful is the knee now, range of motion, measuring for any flexion deformity, extension lag, Lachman test for antero-posterior stability and valgus and varus stress test for lateral stability. Clinical information and findings were documented in a preformed proforma (appendix 1) All the scores were documented by the patients which were again checked by the Orthopaedician. Various scores that are evaluated were KSS(functional), PCS, FJS,

WHO-QOL, VAS, ROM and SF-36. The FJS was collected at 6 months as well 12 months. These scores were calculated for all the patients and charted on excel sheet and run on SPSS in order to know the correlation.

All patients who completed TKA with 6 months follow up were given a questionnaire and requested them to fill all the scores.

Data collection methods: All TKA patients who completed 6 months were called to OPD telephonically.

Periodicity of data collection: All patients were called at 6 months and 12 months of TKA.

Statistical analysis:

The spearman correlation coefficient was used in comparing functional knee out come scores.Mann whitney U test was for comparison of VAS with other functional outcome scores. Wilcoxen test was used in comparison of FJS at 6 months and FJS at 12 months. The data is reproduced graphically by using various types of chart, bar diagram, pie chart. SPSS (IBM SPSS version 23.0. Armonk, NY: IBM Corp.)

Sample size

We have conducted a time bound study from January 2020 to March 2021 in which 96 were enrolled in this study during this period.

Sample size calculation

As no previous similar study was done so we have taken the patients who have undergone TKA in our time duration.

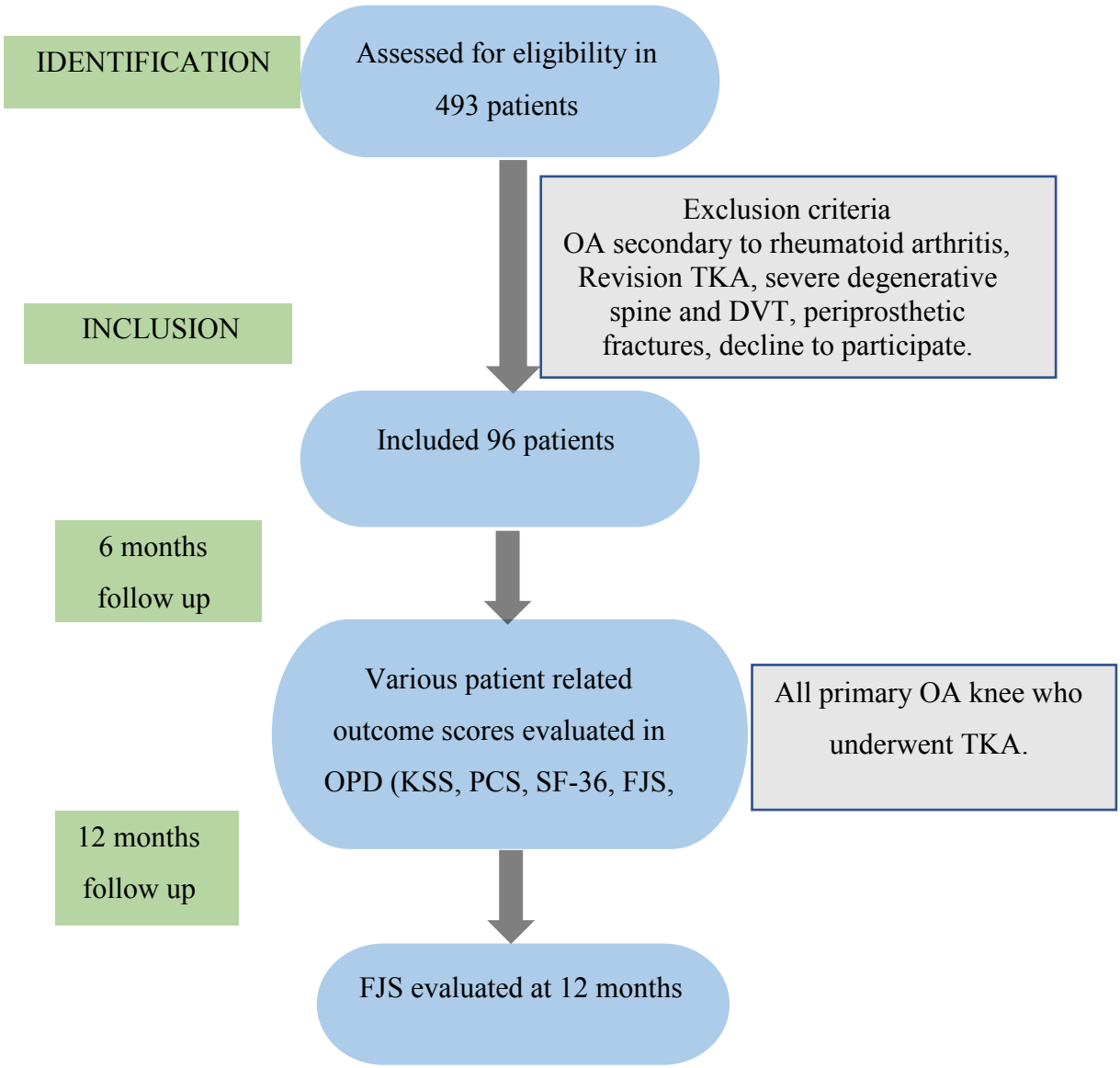

Fig 2 Study flow diagram.

Results

RESULTS

Total of 96 patients who underwent TKA were evaluated for 5 different types of scores (KSS, PCS. FJS, WHOQOL and SF-36). A total 138 knees were evaluated for various functional outcomes.

Age of study population is described in bar chart.

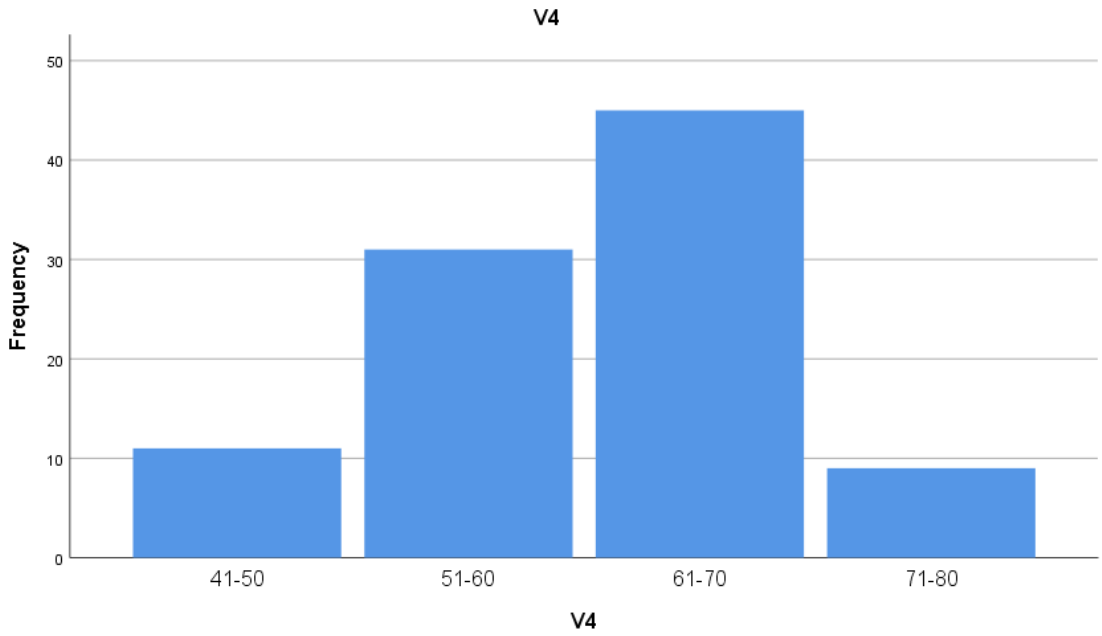

Fig 3. Bar diagram showing distribution of ages in this study.

Of the total patients there was a mean age of 60.98 years, median of 61.50 and mode of 60 years with a standard deviation of 8.075 with a minimum of 42 years and maximum of 78 years.

Of the total 96 patients there were 33 male patients and 63 were female patients, which is represented by pie chart .

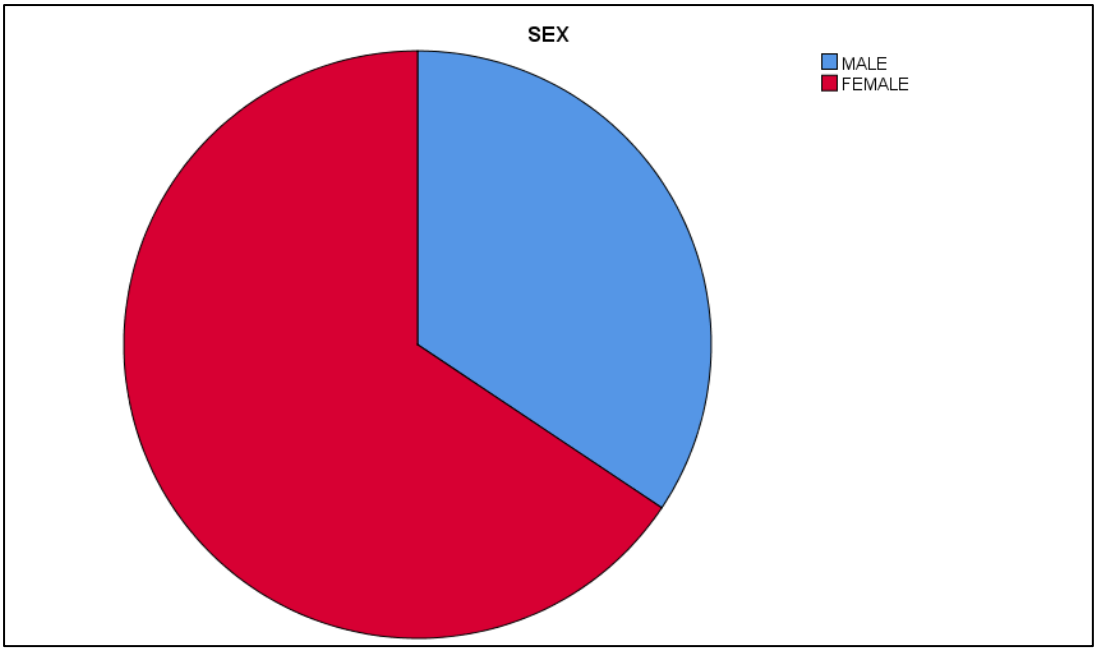

Fig 4.Pie diagram showing the number of females and males in this pie diagram

TABLE 2: CORRELATION OF KSS WITH OTHER FUNCTIONAL SCORES.

SCORE	Significantly correlated (Yes/no)	KSS Correlation coefficient (p value)
1.PCS	No	.890(.386)
2.FJS-12	Yes	.290 (.004)
3.WHO QOL		
3(a).WHO-QOL(Physical)	No	-.102(.320)
3(b).WHO-QOL(Physicological)	Yes	-.207(.043)
3(c).WHO-QOL(Social)	No	-.039(.707)
3(d).WHO-QOL(Environment)	Yes	.213(.037)
4.SF-36		
4(a).SF-36(Physical)	No	.175(.088)
4(b).SF-36(Role limitation due to physical health)	Yes	.269(.008)
4(c)SF-36(Role limitation due to emotional problems)	No	.028(.785)
4(d)SF-36(Energy)	Yes	.220(.031)
4(f).SF-36(Social functioning)	No	.016(.881)
4(g).SF-36(Emotional well being)	No	.207(.043)
4(h)SF-36(General health)	No	.100(.331)
4(i)SF-36(Pain)	No	.036(.731)

TABLE 3: DESCRIPTION OF KSS AMONG THE STUDY POPULATION

(Values are represented as mean, standard deviation, minimum and maximum)

SCORES	MEAN	STD DEVIATION	MIN.	Max
KSS	85.76	6.877	70	98

KSS has a mean of 85.76±6.877 for all the patients, with a range of 28 (min 70 and maximum value of 98). KSS in comparison with PCS are not significantly correlated. KSS on comparison with Forgotten Joint Score-12 was found to be positively correlated. KSS on comparison with WHO QOL was found to be significantly correlated with psychological and mildly positively correlated with environmental domain. KSS in comparison with SF-36 was found to be significantly correlated with role limitation due to physical health, energy, emotional well-being. Ceiling effect and floor effect was 0 % for KSS.

SCATTER PLOTS SHOWING CORRELATION OF KSS WITH VARIOUS SCORES

KSS Vs FJS

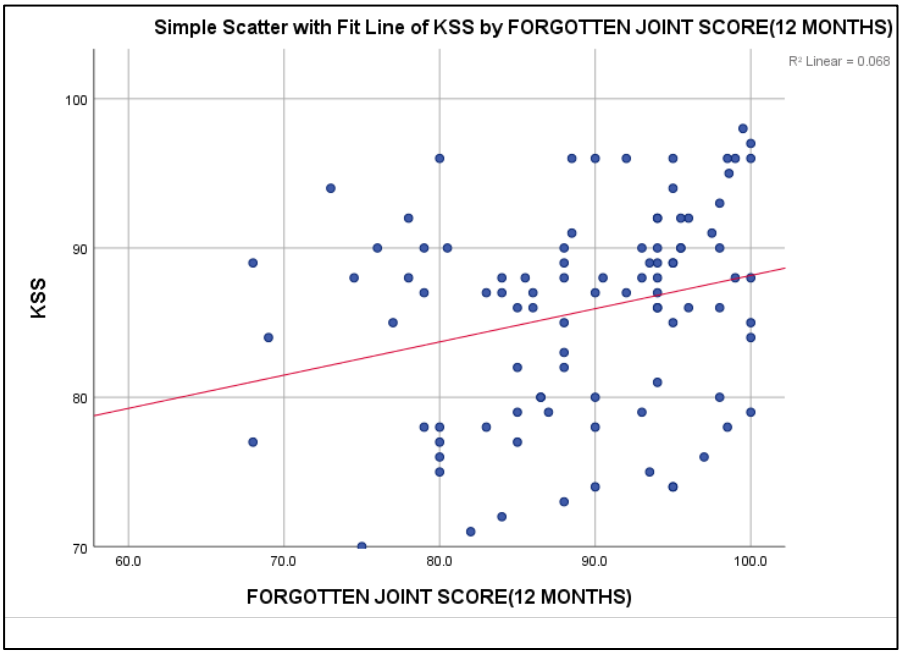

Fig 5. Scatter chart showing positive correlation of KSS and forgotten joint score.

KSS VS WHO QOL(PSYCHOLOGICAL)

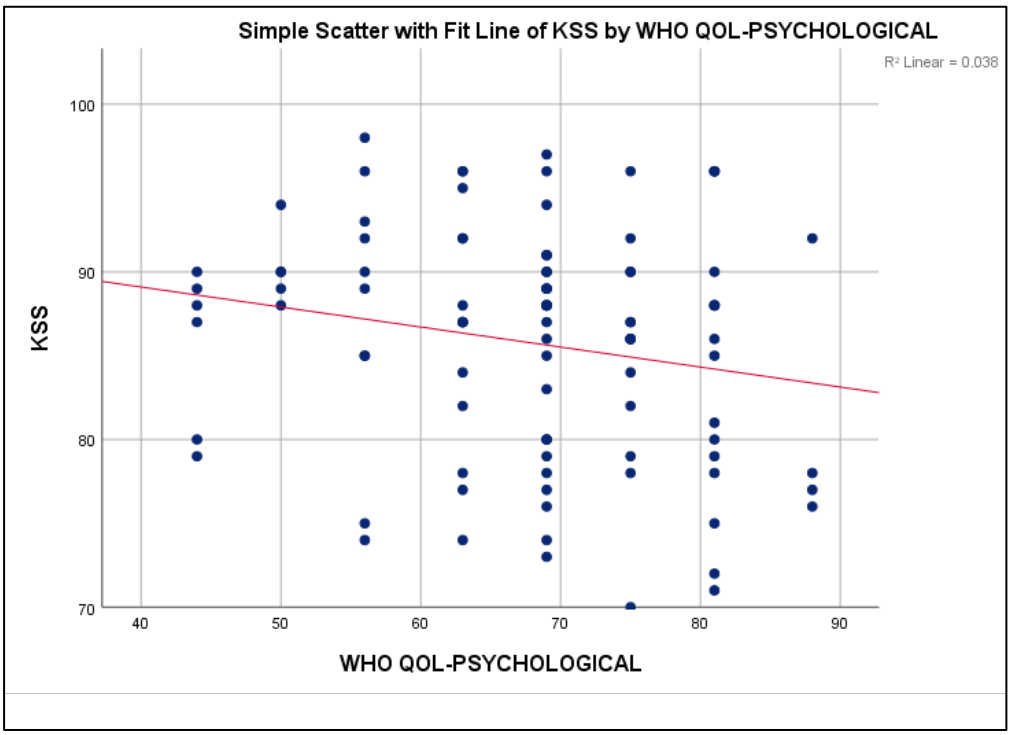

Fig 6. Scatter plot showing negative correlation of KSS with WHO QOL(psychological domain).

KSS VS WHO QOL(ENVIRONMENTAL)

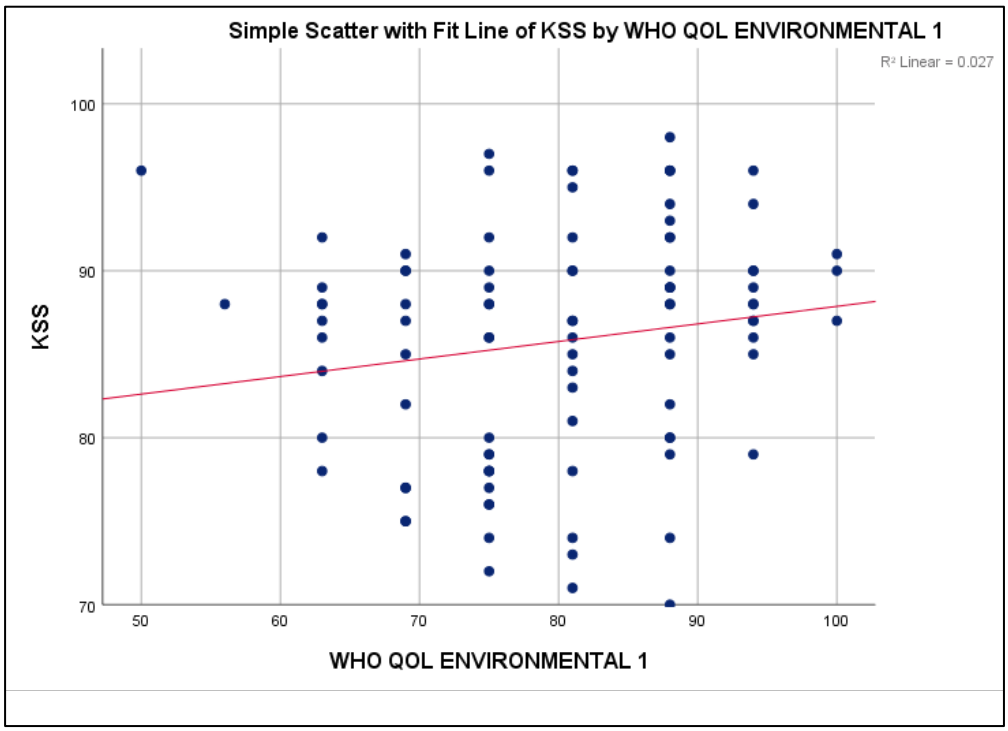

Fig 7. Scatter plot showing positive correlation between KSS and WHO QOL(environmental).

KSS Vs SF-36(ENERGY)

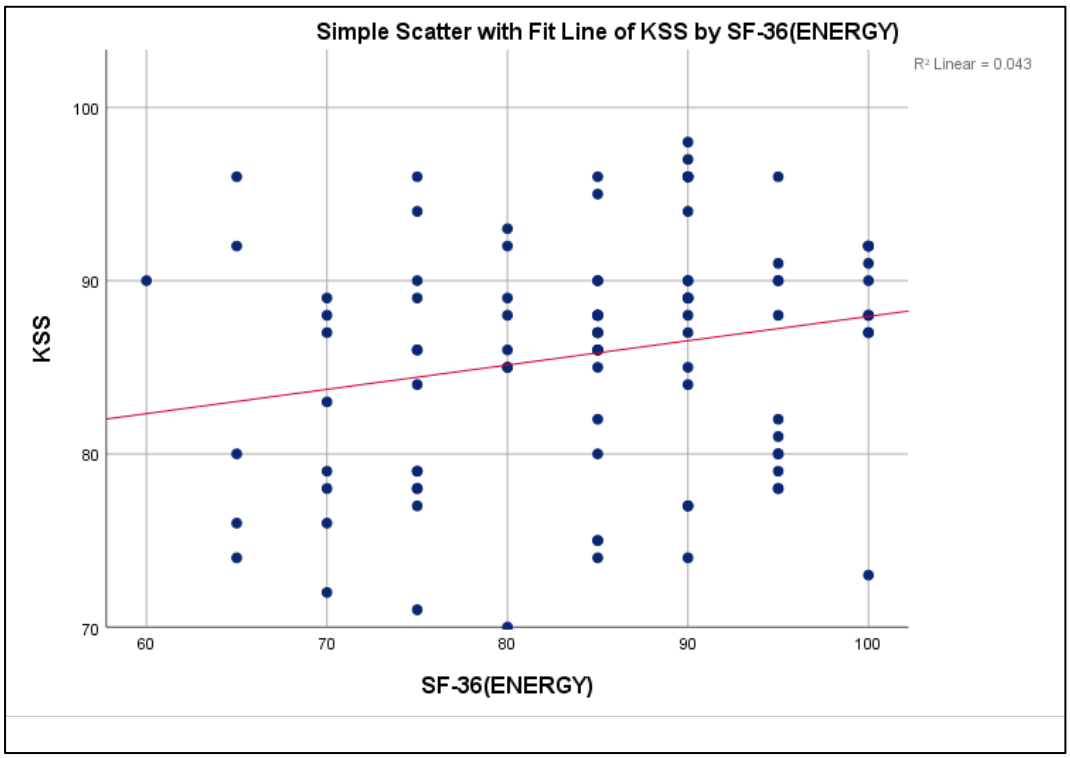

Fig 8. Scatter diagram showing positive correlation between KSS energy domain of SF-36.

KSS Vs SF-36(EMOTIONAL)

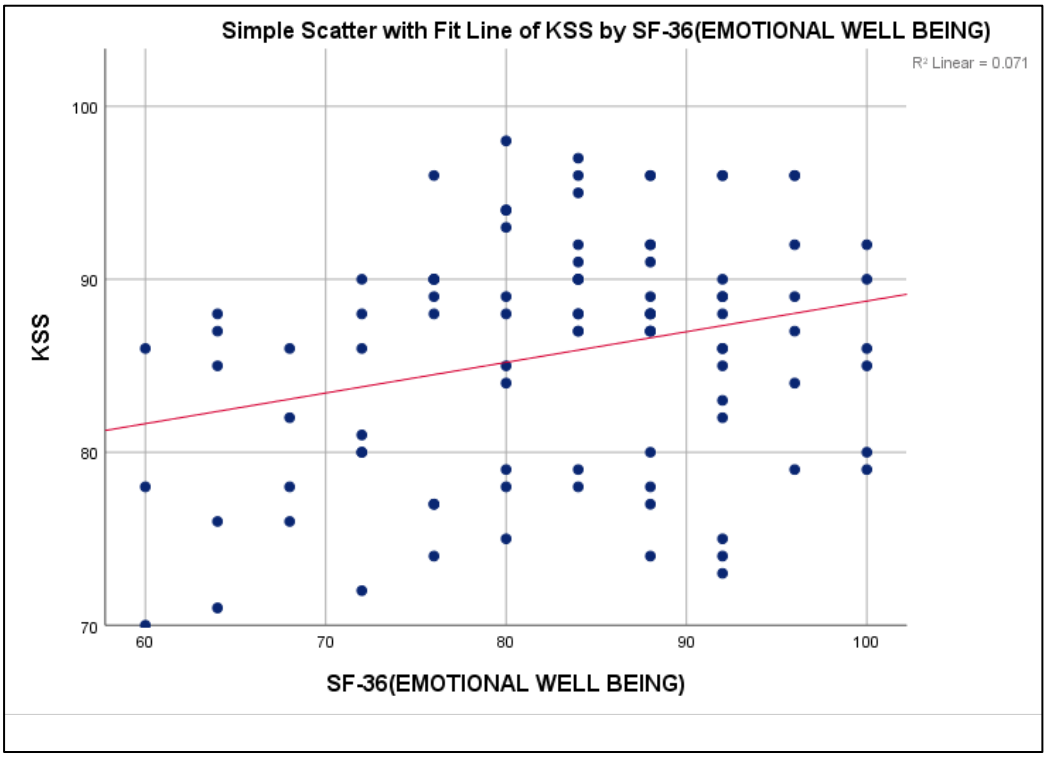

Fig 9. Scatter plot showing positive correlation between KSS and emotional well being of SF-36.

TABLE 4:CORRELATION OF PCS WITH OTHER FUNCTIONAL SCORES

SCORES	SIGNIFICANTLY CORRELATED (Yes/No)	PCS Correlation coefficient(p value`)
1.FJS-12	Yes	-.226(.002)
2.WHO Qol		
2(a).WHO-QOL(Physical)	No	.143(.166)
2(b).WHOQOL(Psychological)	No	-.072(.483)
2(c).WHO-QOL(Social)	No	-.089(.386)
2(d).WHOL-QOL(Environmental)	No	.089(.388)
3.SF-36		
3(a).SF-36(Physical)	No	.058(.578)
3(b).SF-36(Role limitation due to physical health)	No	.023(.821)
3(c).SF-36(Role limitation due to emotional problems)	No	.009(.931)
3(d).SF-36(Energy)	No	.581(.124)
3(e).SF-36(Emotional well being)	No	.108(.296)
3(f).SG-36(Social functioning)	No	.076(.461)
3(g).SF-36(GENERAL HEALTH)	No	.057(.580)
3(h)SF-36(Pain)	Yes	-.399(.04)
3(i).SF-36(health change)	No	.473(.530)

TABLE 5: DESCRIPTION OF PCS AMONG THE STUDY POPULATION(Values are represented as mean, standard deviation, minimum and maximum)

SCORES	MEAN	STD DEVIATION	MIN.	Max
PCS	5.24	2.994	0	14

PCS in this study has mean of 5.23± 2.994 with range of 14(minimum of 0, maximum of 14).PCS on comparing with FJS 12 was found to be significant. PCS when compared with WHOQOL was found to be not significant. PCS when compared with SF-36 was found to be significant with pain.

COMPARISION OF PCS WITH FJS-12

Simple scatter of PCS with FJS

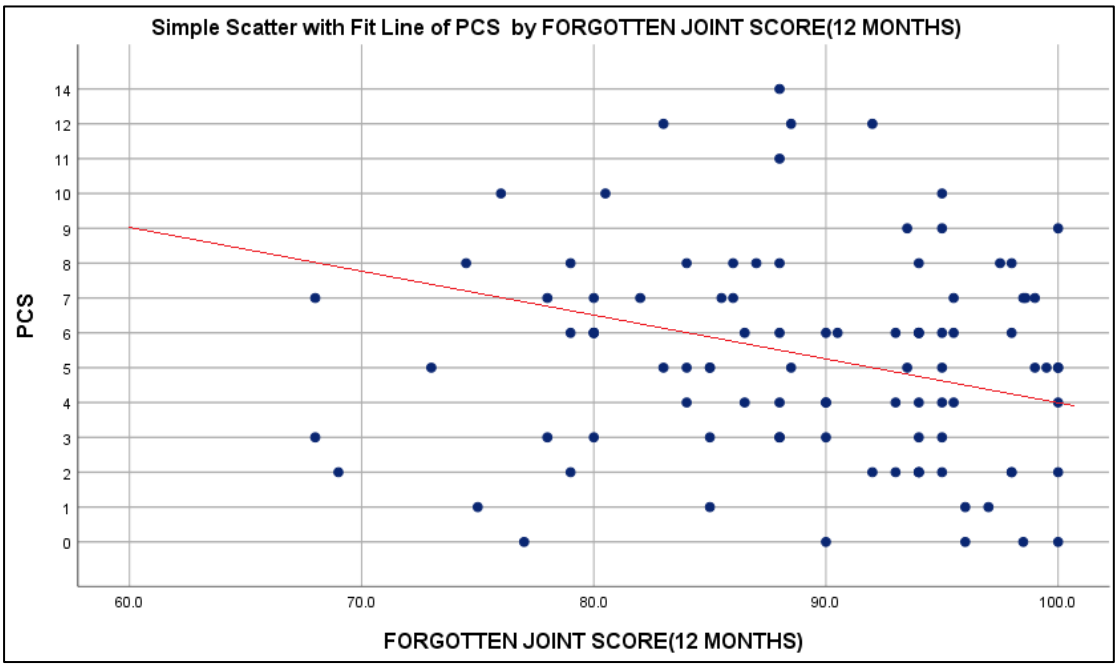

Fig 10. Scatter diagram showing PCS is negatively correlated with FJS-12.

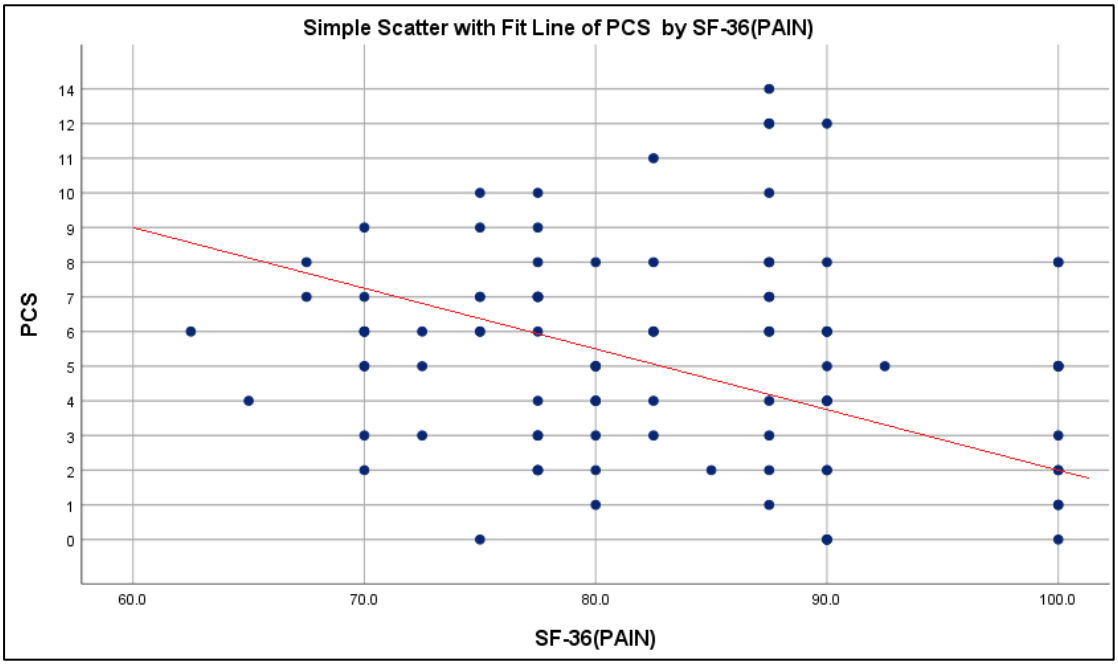

Fig 11.Scatter diagram showing negative correlation negative correlation of PCS with pain domain of SF-36

TABLE 6: CORRELATION OF FORGOTTEN JOINT SCORE 12 MONTHS WITH OTHER FUNCTIONAL SCORES

SCORES	SIGNIFICANTLY CORRELATED (Yes/No)	FORGOTTEN JOINT SCORE Correlation coefficient(p value)
WHOQol(physical)	No	.086(.404)
WHOQol(psychological)	Yes	.340(.002)
WHOQol(social)	No	.290(.340)
WHOQol(environmental)	Yes	.310(.000)
SF-36(physical)	Yes	.226(.034)
SR-36(role limitation due physical problems)	No	.025(.226)
SF-36(role limitation due to emotional problems)	No	-.027(.794)
SF-36(energy)	No	-.137(.183)
SF-36(Emotional well being)	No	-.060(.560)
SF-36(social functioning)	No	.030(.773)
SF-36(general heath)	No	-.106(.302)
SF-36(pain)	No	.199(.302)
SF-36(general health)	No	.158(.124)

TABLE 7: DESCRIPTION OF FJS AMONG THE STUDY POPULATION(Values are represented as mean, standard deviation, minimum and maximum)

SCORES	MEAN	STD DEVIATION	MIN.	Max
FJS	82.209	8.0598	68	100

FJS has a mean of 89.209 ± 8.0598 with a range of 32(minimum of 68 and maximum of 100).FJS 12 when compared with WHO QOL was found to be significant to psychological and environmental domains. FJS 12 when compared with SF-36 was found to be significant to physical. Ceiling effect was calculated and was found to be 6.25 % and floor effect was 0 %.

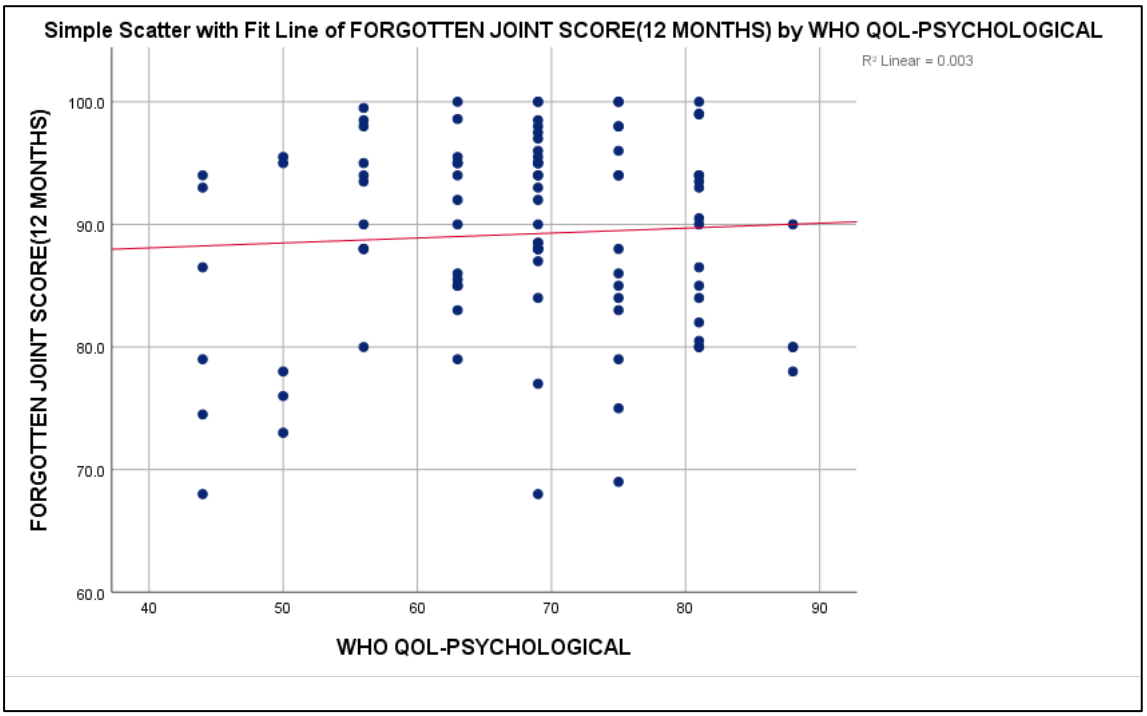

Fig 12. FJS showing positive correlation with Psychological domain of WHO Qol.

COMPARISON OF FORGOTTEN JOINT SCORE WITH WHO-QOL

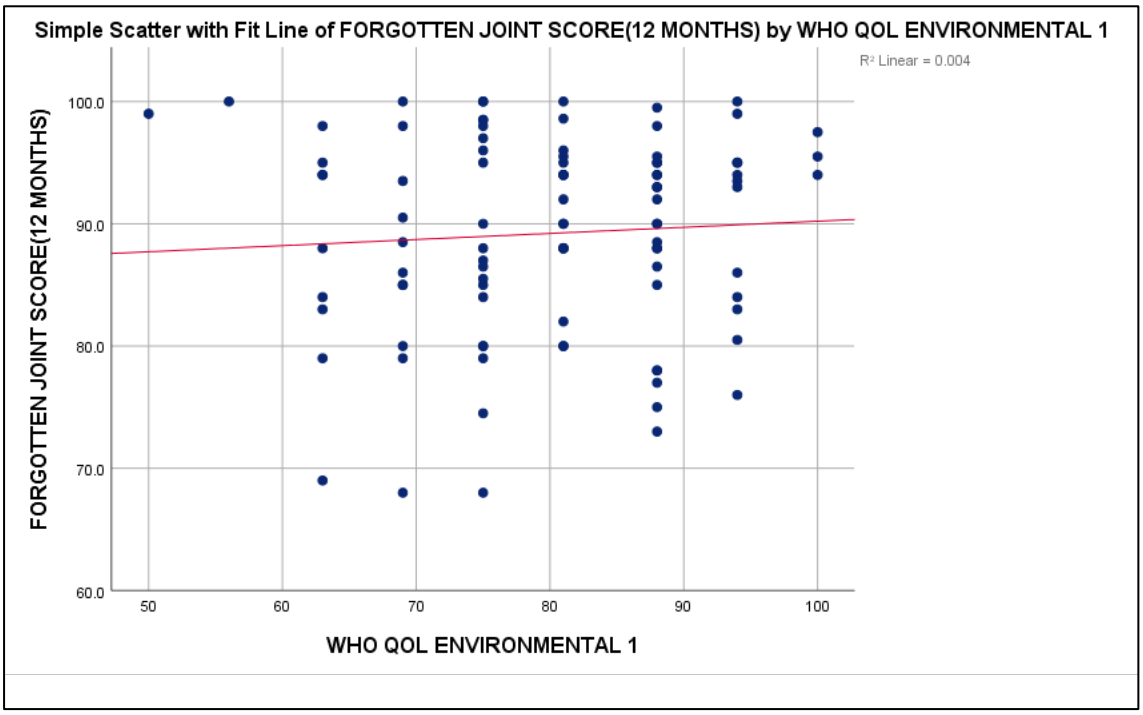

Fig 13. Scatter diagram showing positive correlation with environmental domain of SF-36.

COMPARISON OF FJS-12 WITH SF-36

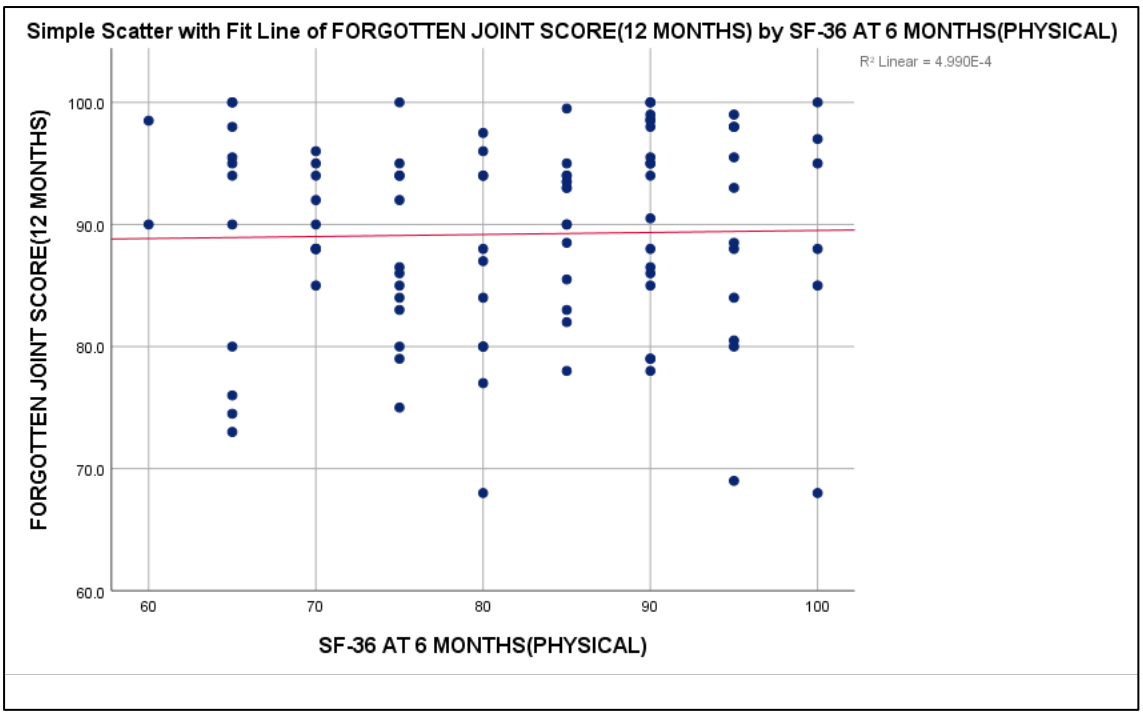

Fig 14. Scatter plot showing positive correlation of FJS with physical aspect of SF-36.

TABLE 8: DESCRIPTION OF WHO QOL AND SF-36 AMONG THE STUDY POPULATION (Values are represented as mean, standard deviation, minimum and maximum)

SCORES	MEAN	STD DEVIATION	MIN.	Max
WHO QOL-physical	71.25	10.028	44	94
WHO QOL-psychological	67.95	11.207	44	84
WHO QOL-social	82.70	14.269	48	100
WHO QOL-environmental	79.93	10.704	50	100

SCORES	MEAN	STD DEVIATION	MIN.	Max
SF-36(physical)	81.88	10.864	60	100
SF-36(role limitation due to physical problems)	86.20	14.450	50	100
SF-36(role limitation due to emotional problems)	87.166	16.292	66.7	100
SF-36(energy)	87.48	10.169	60	100
SF-36(social functioning)	81.641	12.6898	50	100
SF-36(emotional well being)	83.17	12.689	60	100
SF-36(pain)	88.23	8.583	65	100
SF-36(general health)	95.31	9.809	75	100

WHO QOL

WHO QOL when compared with SF-36 physical domain was found to be significant to, positively with energy component, social functioning. WHO QOL when compared with SF-36 psychological domain was found to be significant role limitation due to emotional problems, social functioning and emotional well being. WHO QOL when compared with SF-36 the social domain was found to be significant to role limitation due physical health. WHO QOL when compared with SF-36 environmental domain was found to be insignificant.

COMPARISON OF PHYSICAL DOMAIN WITH WHO-QOL

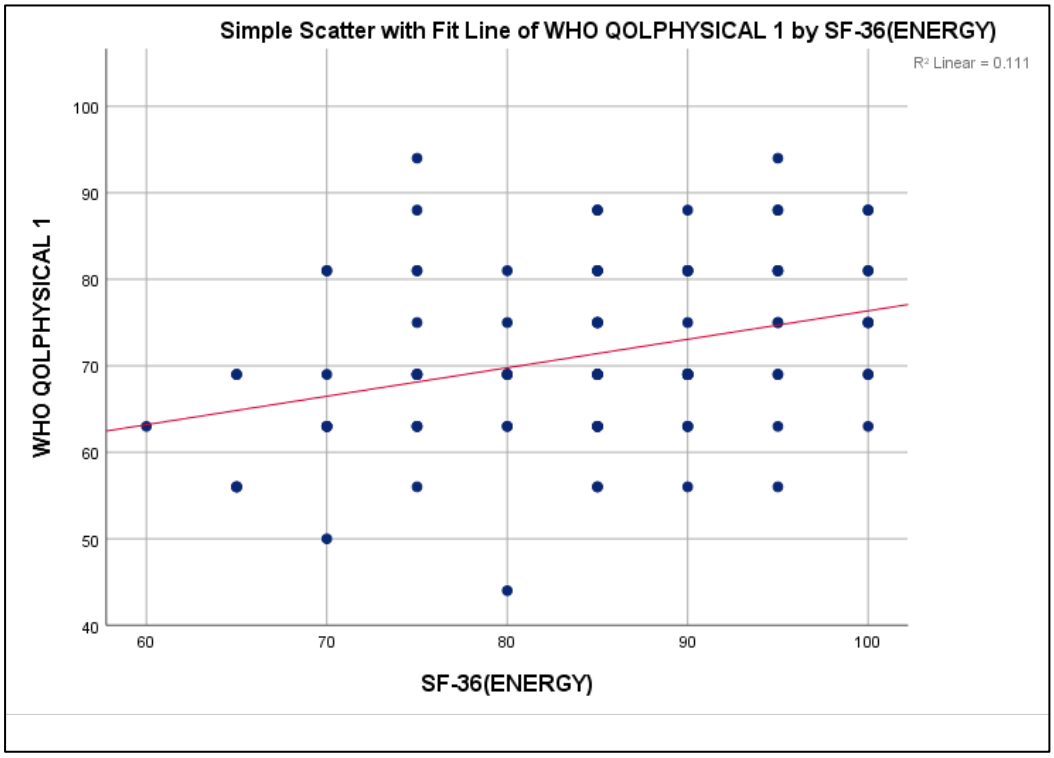

Fig 15. Scatter plot showing positive correlation between WHO QOL (physical domain) and energy domain of SF-36.

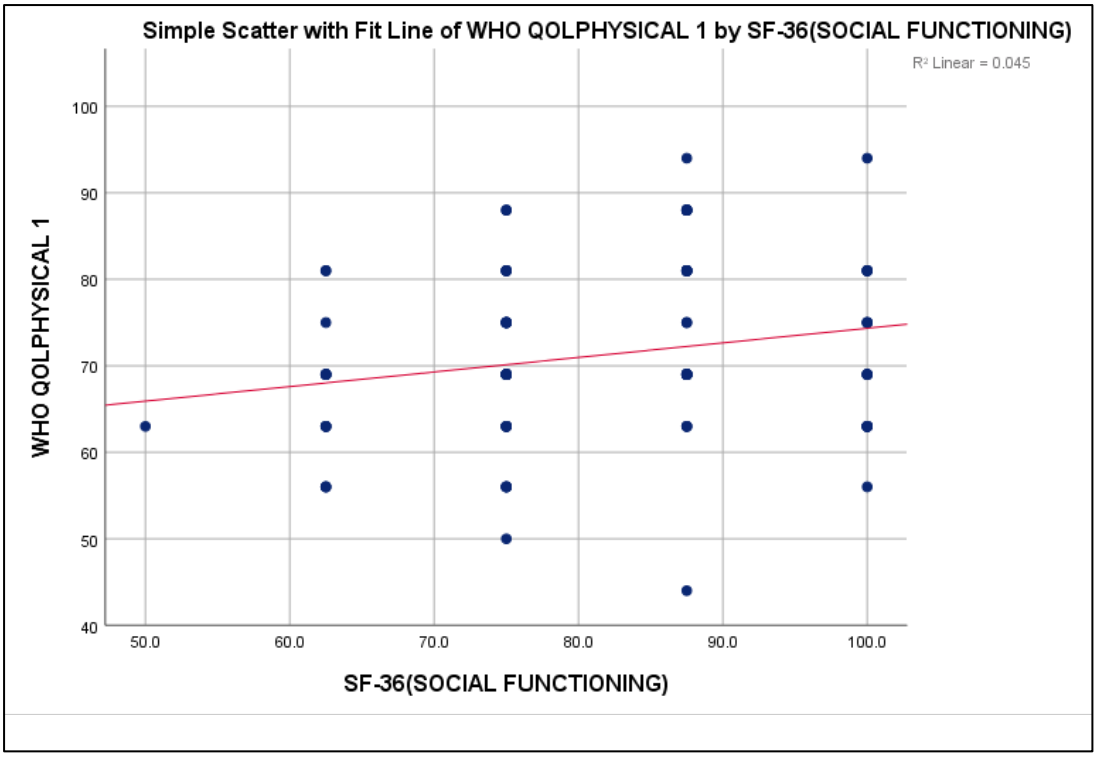

Fig 16. Scatter diagram showing positive correlation WHO QOL(Physical) with social functioning of SF-36.

COMPARISON OF PSYCHOLOGICAL DOMAIN WITH OTHER SCORES

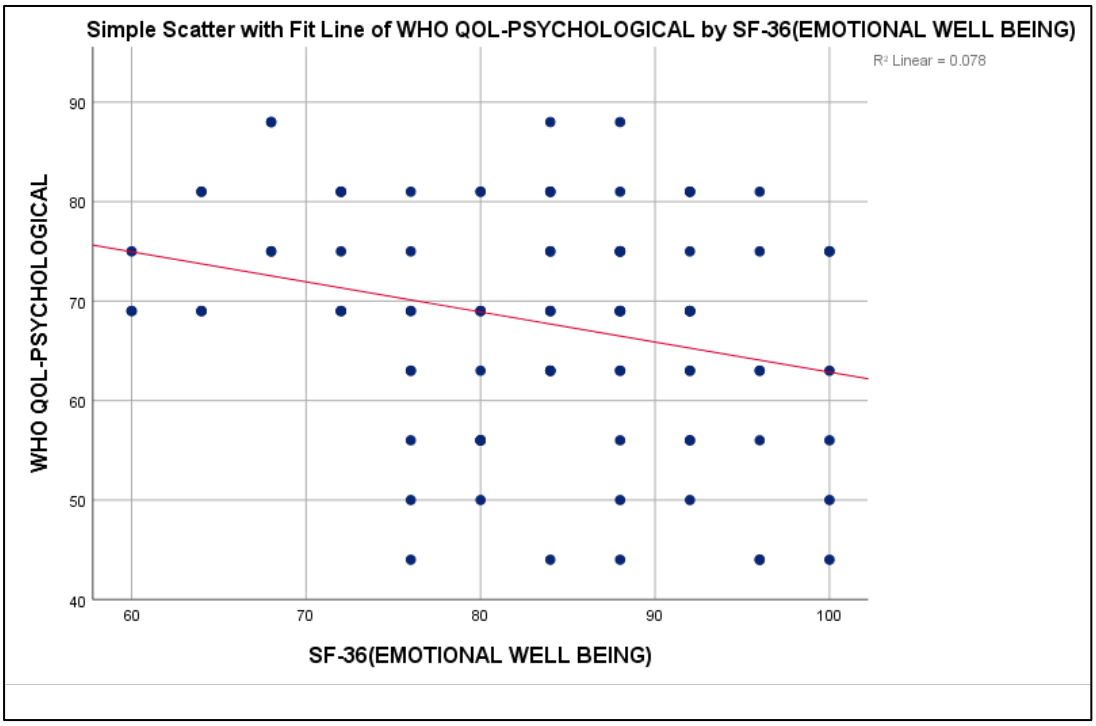

Fig 17. Scatter diagram showing negative correlation of WHO-QOL(Psychological)with emotional well being aspect of SF-36.

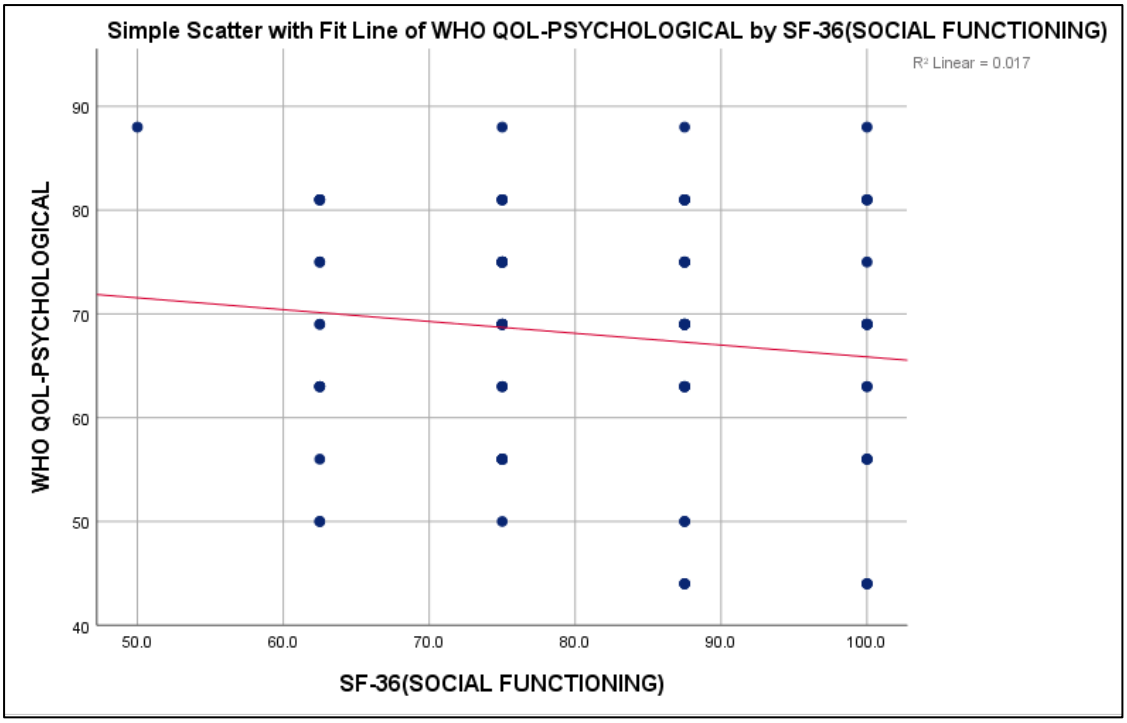

Fig 18. Scatter plot showing negative correlation WHOQOL(Psychological) with social functioning.

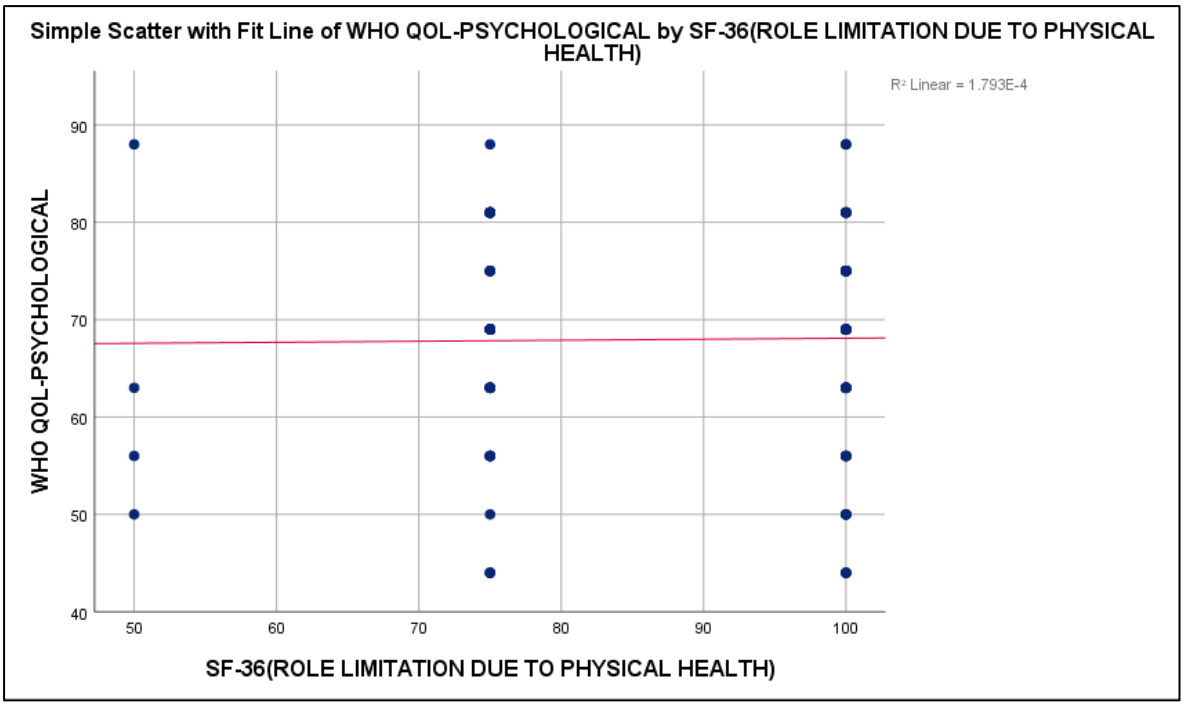

Fig 19. Scatter plot showing positive correlation between SF-36(role limitation due to physical health) and WHO Qol (psychological)

2nd objective

COMPARISON OF VAS AND ROM WITH FUNCTIONAL KNEE OUTCOMES

VAS on comparison with KSS was found to be clinically insignificant(p>.05). VAS when compared with PCS was found to be clinically insignificant. VAS when compared with FJS was found to be clinically insignificant. VAS when compared with WHO-QOL was found to be clinically significant with physical domain and was insignificant with other domains. VAS when compared with SF-36 was found to be significant to be significant to be significant to role limitation due to physical health. ROM when compared with KSS was found to be insignificant. ROM when compared PCS was found to be insignificant. ROM when compared with FJS was found to be insignificant. ROM when compared with WHOQOL only psychological domain was found to be insignificant .ROM on comparing with SF-36 was found to be insignificant.

Scatter diagrams of VAS with WHO QOL.

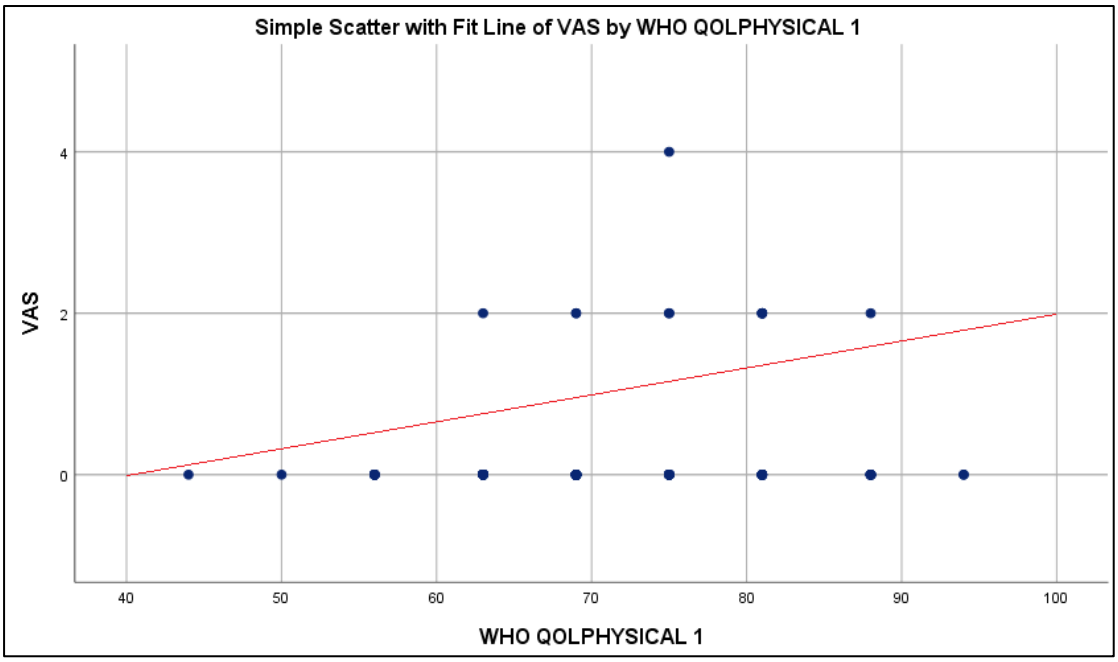

Fig 20. Scatter diagram showing positive correlation with physical domain of WHOQol.

3rd objective

COMPARISON OF FJS AT 6 MONTHS AND FJS-12 MONTHS

FJS – at 6 and 12 months using → Wilcoxan signed rank test – for comparing 2 related samples which are not normally distributed

Table 9: Comparison of FJS At 6 Months And FJS-12 Months

Ranks				N
	Negative ranks	5	8.90	44.50
	Positive ranks	87	48.66	4233.50
	Ties	4		
Forgotten Joint score(12 months) Forgotten joint score(6 months)	Total	96		

Test statistics

	Forgotten joint score(12 months)forgotten joint score(6 months)
Z	-8.156
Asymptomatic significance(2-tailed)	.000

When FJS was compared with it at 6 months and 12 months it was found to be significant correlated.

The mean of FJS at 6 months was 72.473 where as FJS at 12 months was found to be 83.245.

Discussion

DISCUSSION

In this study a total of 96 patients were enrolled of which 63 were females and 33 were males. The mean age of 60.98 years. The patients had a range of age from 42 to 78 years. These patients underwent TKA in AIIMS, Jodhpur from January 2020 to March 2021. All these patients were diagnosed with primary Osteoarthritis of knee.

Post TKA a lot of patient related outcome scores have been introduced to evaluated the quality of life as well as operated knee function. Various functional outcome scores were correlated like KSS, PCS, FJS, WHOQol, SF-36(66).

Functional KSS values are used post-operatively for evaluating outcomes of TKA. The KSS values raised significantly after surgery. KSS had a mean value of (85.76±6.877) at final follow up which were on the higher range in comparison to other studies with similar follow up(67).

KSS on comparing with pain catastrophizing score was found to be not significant suggesting there is no correlation between KSS with PCS as p =.386 same has been quoted in literature Wood TJ *et al* there was no correlation of KSS and PCS (68). Thus, saying both KSS and PCS are independent components implying decrease in pain due OA knee after TKA is independent of increase in physical and functional outcome of operated knee.

KSS on comparing with Forgotten Joint Score was found to be positively correlated i.e. as KSS increases FJS also increases (with a p value of .004), suggesting that better physical and functional score lead to increasing ability to forget the operated knee which is also supported by literature where as there was mildy positive correlation of KSS and FJS by a study by Maniar *et al.*(69). This suggests that FJS and KSS have parallel movement but may not be interchangeable. In assessing the patient's outcome following TKA, FJS may capture information that is unique and different from KSS.

A strong Ceiling effect reduces a scale's sensitivity to change over time as well as its ability to discriminate well between different high-performing groups. FJS had a ceiling effect of 6.25 percent, whereas KSS had a ceiling effect of 0%. In terms of

discriminatory power, the KSS outperforms the FJS. With FJS, we discovered a 0% floor effect, and with KSS, we discovered a 0% floor effect.

KSS on comparison with WHO QOL was found to be significant negative with psychological and positively significant environmental domains suggesting that the better physical and functional ranges of knee increases the quality of life in contrast to our study according to Sila *et al.* improvement in the functional aspect of QOL when compared with KSS. (70)

KSS on comparison with SF-36 shows significant correlation with role limitation due to energy, emotional well-being and role limitation due to physical health suggesting the increase in the quality of life is actually associated with increase in the physical and functional range of motion. This is in contrast to Lingard *et al, who* found a strong correlation between KSS and pain aspect of SF-36.(71)This poor correlation of KSS with SF-36 is logical as the satisfaction index focuses on the knee as done by Knee Society rating system, while the SF-36 is a more general assessment. The SF-36 measures the general physical function and health, which are influenced not only by TKA outcomes but also by other factors.

PCS compared with WHO-QOL was found to be insignificant with all the domains where as according to Monllor *et al* participants with high postoperative PCS had lower QoL during all rehabilitation periods and had less significant improvements over time when compared with those with low PCS.(72).Thus, Pain and pain catastrophisation are also expected to have profound association with quality of life.

PCS when compared with SF-36 was insignificantly correlated with physical, role limitation due to physical activity, role limitation due to emotional problems, energy, emotional well being, social functioning, general health, health change except for pain which showed negative correlation. In coherence to this study in literature according to Ma *et al* higher PCS score was with poor SF-36 score.(73).Indicating negative correlations can be explained as the patient can “forget his joint” by higher scores that indicate good outcome, i.e., a high degree of being able to forget about affected joint in daily life comparing with improved other subjective impairments like pain.

FJS in comparison with SF-36 was found to be significant to physical in coherence to this study in literature according to Irem *et al* there was low correlation of FJS with SF scoring system.(74).This is mainly because of FJS was less sensitive for measuring general health.

WHO QOL in comparison with SF-36 physical domain was found to be significant to physical component, energy component, social functioning, pain and was insignificant with role limitation due to emotional well being, general health. health change and role limitation due to physical activity. WHO QOL when compared with SF-36 psychological domain was found to be significant to role limitation due to emotional well being and general health. WHO QOL when compared with SF-36 the social domain was found to be significant to role limitation due physical health, general health and WHO QOL when compared with SF-36 environmental domain was found to be significant to none. Even in literature there was weak correlation of WHOQol and SF-36 according to Escobar *et al.(* 75*)*.Bonomi et al. reported that physical health subscales (Physical functioning, Role limitation due physical problems, Bodily Pain and General Health) of the SF-36 were moderately correlated (r-0.6–0.4) with both physical and psychological subscales of the WHOQOL.(76)This varied correlation is due to the fact that measuring quality of life is complex. The SF-36 and WHOQOL-BREF are often used interchangeably to measure generic QOL. However, these instruments appear to measure different QOL constructs: the SF-36 seems to measure HRQOL, whereas the WHOQOL-BREF measures global QOL. This is the reason for there poor correlation.

Comparison of VAS and ROM with functional outcome scores.

VAS on comparison with KSS was found to be insignificant which is supported by literature according to Schuster *et al*. reported similar results but he also found no correlation between ROM, VAS pain and function scores.(77) even in studies of Qin *et al* there was poor correlation of VAS with KSS.(78) This is because VAS is influences by a large number of factors(social, mental, physical, present complaints other than knee) where as KSS is suggestive of the operated knee.

In this study VAS on comparison with PCS was found to be in significant. In coherence to this study according to Wade *et al.* pain catastrophizing has shown to be highly correlated with pain intensity after TKA.(79). Suggesting Catastrophizing has been shown to influence pain perception directly, through its influence on affective and attentional responses to pain.

In this study VAS on comparison with FJS was found to be insignificant however in literature according to Pansky *et al.* the strong negative correlation of (-0.8) indicates that knee pain is still a significant factor impacting joint awareness. The correlation was negative because a high VAS suggests an undesirable outcome while a high FJS-12 score indicates a desirable outcome.(80)

VAS on comparison WHOQol was significantly correlated with physical domain and was insignificant with other domains in contrary to this study VAS and ROM affected the social relationship domain of WHOQOL according to Bouras *et al*.(81)

VAS when compared with SF-36 was found to be significant to be significant to role limitation due to physical health where as in contrary to this study literature there was no correlation of VAS and pain domain of SF-36 according to Nacca *et al*. (82)Pain directly affects physical activities of patients who underwent TKA.

Usually FJS is calculated at 12 months in our study we have calculated FJS at 6 months and FJS at 12 months. In our study we have found more reliability of FJS at 12 months rather than at 6 months. There was a progressive increase in FJS scores at 12 months when compared at 6 months.(Because higher FJS indicates normalisation of joint)(83).However according to literature by Chithratha *et al.* between 3 weeks and 6 months after surgery, patients who had TKA had a significant improvement in their FJS score. However, no significant difference was found between 6 months and 1–5 years after surgery. The score begins to decline after 7 years, and there is a significant difference in the score between 1 and 5 years post-operative to that of 7 and 10 years post-operative. (84)

In another study, Hiyama *et al.* discovered a significant increase in the FJS score between 1 month and 6 months after surgery. There was no significant difference between the 6-month and 1-year postoperative intervals. (85)

Carlson *et al.* study also shows a significant improvement in FJS immediately after surgery, followed by a plateau from 1 to 3 years, followed by a drop in the score at 5 years. (86)

In this study TKA done in patients with severe osteoarthritis is associated with

Better KSS →were associated with better physical activity,better function ,decreased pain→improved quality of life →increased tendency to forget joint.

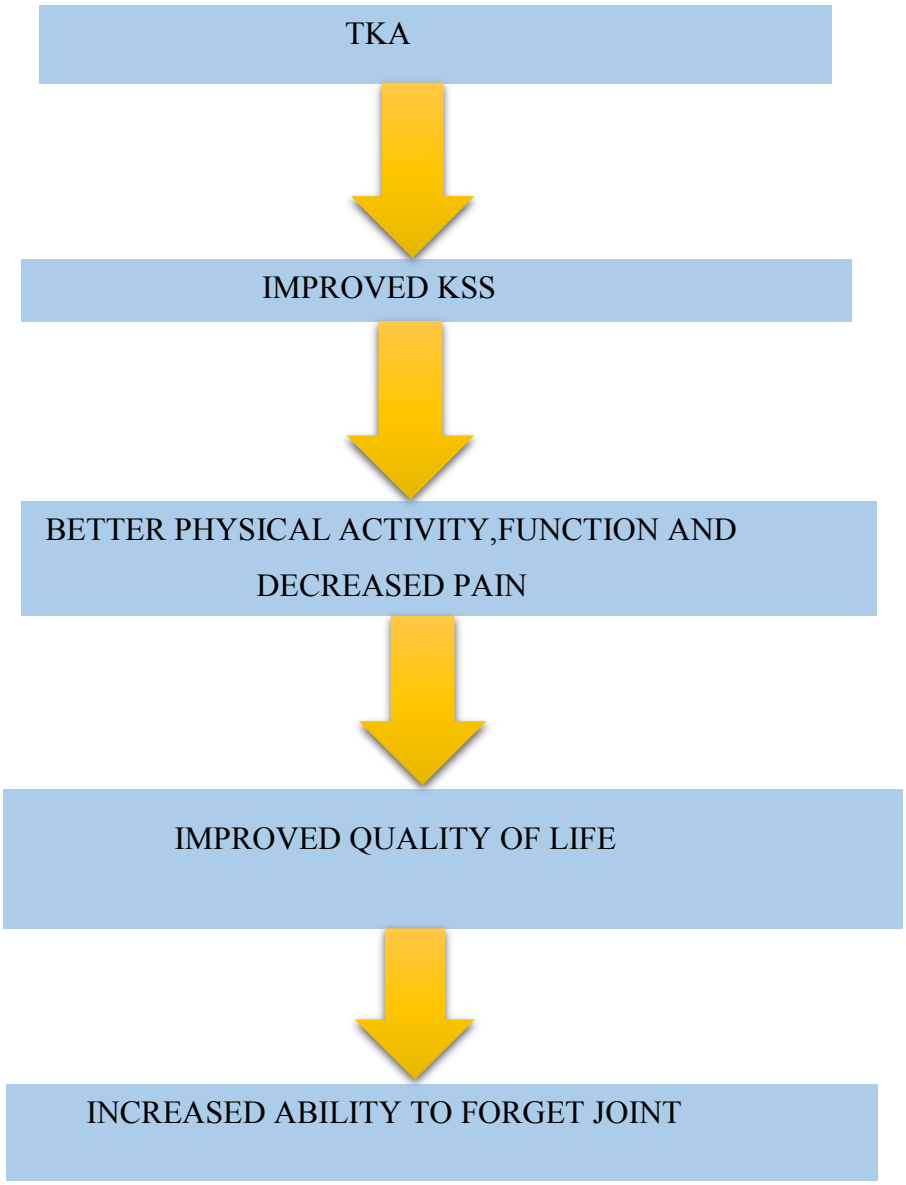

Fig. 21 Flow chart showing effects of TKA in patients who underwent the surgery.

STRENGTHS AND LIMITATIONS

STRENGTHS

1.All the patients were operated by same surgeon (similar technique)

2.Surgeon and hospital related factor.

3.Prospective study better level of evidence

4.Multiple scores have been correlated.

5.No other study has compared these many functional scores.

LIMITATIONS

1.Small sample size

2.Single Centre leading to lack of generalizability.

3.Patients who underwent TKA belonged to a single region (Rajasthan).

4.2 point contact with patients.

Conclusion and Recommendations

CONCLUSION

In this current study we have seen that there was significant correlation of KSS with FJS.

KSS is also significantly correlated with WHO Qol (psychological, environmental) and SF-36(role limitation due to physical health, energy).

FJS was significantly correlated with SF-36 (physical) and WHOQOL (psychological and environmental).

PCS in comparison with SF-36 was negatively related to only pain domain. PCS in comparison to WHO QOL was found out to be insignificant.

WHO Qol and SF-36 in comparison showed a varied result suggesting both questionnaires can be used interchangeably.

VAS and ROM was found to be significant correlated to PCS, WHO Qol (physical) and SF-36(role limitation due to physical health).VAS and ROM was found to be insignificantly correlated to FJS ,KSS,PCS.

FJS 12 is a better score to evaluate at 12 months on comparison at 6 months.

RECOMMENDATIONS

1.For better evaluation of patients after TKA a combination of local and systemic score would help in better evaluation.

2. A larger multicentric study will be required for validating the findings of this study

3.Postulating a new score for evaluating the patients who underwent TKA.

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Annexures

Annexure-I

अखिल भारतीय आयुर्विज्ञान संस्थान, जोधपुर
All India Institute of Medical Sciences, Jodhpur
संस्थागत नैतिकता समिति
Institutional Ethics Committee

No. AIIMS/IEC/2020/2053 **Date: 01/01/2020**

ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: **AIIMS/IEC/2019-20/967**

Project title: **"Correlation of functional outcome evaluation scores in total knee arthroplasty patients"**

Nature of Project: **Research Project**

Submitted as: **M.S. Dissertation**

Student Name: **Dr.G.Lakshmi Prasad**

Guide: **Dr. Abhay Elhence**

Co-Guide: **Dr. Sumit Banerjee & Dr. Nilesh Barwar**

This is to inform that members of Institutional Ethics Committee (Annexure attached) met on **23-12-2019** and after through consideration accorded its approval on above project. Further, should any other methodology be used, would require separate authorization.

The investigator may therefore commence the research from the date of this certificate, using the reference number indicated above.

Please note that the AIIMS IEC must be informed immediately of:

- Any material change in the conditions or undertakings mentioned in the document.
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research.

The Principal Investigator must report to the AIIMS IEC in the prescribed format, where applicable, bi-annually, and at the end of the project, in respect of ethical compliance.

AIIMS IEC retains the right to withdraw or amend this if:

- Any unethical principle or practices are revealed or suspected
- Relevant information has been withheld or misrepresented

AIIMS IEC shall have an access to any information or data at any time during the course or after completion of the project.

On behalf of Ethics Committee, I wish you success in your research.

Dr. Praveen Sharma
Member secretary
Institutional Ethics Committee
AIIMS,Jodhpur

office record
07/01/20

Enclose:
1. Annexure 1

Page 1 of 2

Basni Phase-2, Jodhpur, Rajasthan-342005, **Website:** www.aiimsjodhpur.edu.in, **Phone:** 0291-2740741 Extn. 3109
Email: ethicscommittee@aiimsjodhpur.edu.in

Annexure-II: ETHICAL JUSTIFICATION

According to guideline setup by ICMR (2000) and Helsinki declaration modified (2008) the following will be adhered to in all patients / volunteers involved in the study.

1. All the possible treatment options will be given and none will be withheld.

2. Patients will be enrolled in the study with their knowledge and study will be done by utilizing known investigation modalities, regarding which proper information will be provided to the patients.

3. Patients will be informed about all the major and minor risk factors and the remedies thereof and a refusal to participate in this study will not interfere with patient doctor relationship.

4. Patients will be given the option of quitting from the study at any point during the study if he or she so desires and no element of compulsion will be exerted.

5. Confidentially of data collected from contribution source or individual will be maintained.

6. Written informed consent will be obtained from all the patients included in the study after informing them about the aims and method of the study and the institutional affiliation of the researcher.

7. In the cases where the patients are legally incompetent, minors or are not eligible for giving consent due to poor neurological status, consent of the close relative available will be taken.

The study will not lead to extra expenditure from the part of patient. The subject will be free to withdraw from the study at any time of their choice. Participation or withdrawal from this study would have no bearing on the treatment being offered to patients.

8. All the patients will be treated by standard protocol of the department of Orthopaedics, AIIMS Jodhpur in the best interest of the patient. All effort will be made to ensure that no extra visits are required for the purpose of study.

9. In publication of the results of this study all efforts would be made to preserve the accuracy of both the positive and negative results of this study.

10. At conclusion of study every patient entered into this study will be assured of access to the best proven diagnostic and therapeutic methods identified by this study.

Annexure-III: DOCUMENTATION OF INFORMED CONSENT(ENGLISH)

I, ……, have read the information in this form (or it has been read to me). I was free to participate in the study. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be include as a participant in

CORRELATION OF FUNCTIONAL OUTCOME EVALUATION SCORES IN TOTAL KNEE ARTHROPLASTY PATIENTS.

(1) I have read and understood this consent form and the information provided to me.

(2) I have had the consent document explained to me.

(3) I have been explained about the nature of the study.

(4) My rights and responsibilities have been explained to me by the investigator.

(5) I have been advised about the risks associated with my participation in the study.

(6) I have informed the investigator of all the treatments I am taking or have taken in the past …..months including any *desi* (alternative) treatments.

(7) I agree to cooperate with the investigator and I will inform him/her immediately if I suffer

unusual symptoms.

(8) I have not participated in any research study within the past ….. month(s).

(9) I am aware of the fact that I can opt out of the study at any time without having to give any

reason and this will not affect my future treatment in the hospital.

(10) I am also aware that the investigators may terminate my participation in the study at any time, for any reason, without my consent.

(11) I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Government agencies, and ethics committee. I understand that they may inspect my original records.

(12) My identity will be kept confidential if my data are publicly presented.

(13) If, despite following the instructions, I am physically harmed because of any substance or any procedure as stipulated in the study plan, [my treatment will be carried out free at the investigational site / the sponsor will bear all the expenses], if they are not covered by my insurance agency or by a government program or any third party.

(14) I have had my questions answered to my satisfaction.

(15) I have decided to be in the research study.

I am aware, that if I have any questions during this study, I should contact at one of the addresses listed above. By signing this consent from, I attest that the information given in this document I will be given a copy of this consent document.

Date: Participant's initials

Place:

Name of the participant:

Complete postal Address:

Signature of principal investigator:

Date:

Place:

This is to certify that above consent has been obtained in my presence.

Witness Signature

Name:

Address:

Name of the Investigator:	Name of the Supervisor/Guide:
Dr. G Lakshmi Prasad	Dr. Abhay Elhence
+91-9346846259	+91-8003996926

Annexure-IV: DOCUMENTATION OF INFORMED CONSENT(HINDI)

सूचित सहमति का दस्तावेज:

मैं... ... ... ने इस फॉर्म में जानकारी पढ़ी है (या यह मुझे पढ़ी गई है) मैं अध्ययन में भाग लेने के लिए स्वतंत्र हूं । 18 वर्ष से अधिक आयु का हूं और अपनी स्वतंत्र शक्ति का प्रयोग कर रहा/रही हूं व इस अध्ययन में भाग लेने की सहमति देता/ देती हूँ ।

"STUDY OF VARIATION IN POSTERIOR TIBIAL SLOPE IN VARIOUS AGE GROUPS AND ITS ASSOCIATION WITH ANTERIOR CRUCIATE LIGAMENT INJURY AND OSTEOARTHRITIS."

(१) मैंने इस सहमति फॉर्म और मुझे प्रदान की गई जानकारी को पढ़ और समझ लिया है।

(२) मुझे सहमति दस्तावेज समझा दिया गया है।

(३) मुझे अध्ययन की प्रकृति के बारे में समझाया गया है।

(४) अन्वेषक द्वारा मेरे अधिकारों और जिम्मेदारियों के बारे में मुझे बताया गया है।

(५) मुझे अध्ययन में मेरी भागीदारी से जुड़े जोखिमों के बारे में सलाह दी गई है।मुझे उन लाभों के बारे में बताया गया है जो कि प्रतिभागी या समुदाय या दूसरों के लिए अनुसंधान के परिणाम के रूप में उचित उम्मीद किये जा सकते हैं ।

(६) मैंने अन्वेषक को उन सभी उपचारों के बारे में सूचित कर दिया है जो मैं ले रहा हूँ या पिछले... ..महीने किसी भी देसी (वैकल्पिक) उपचारों सहित लिया है।

(७) मैं अन्वेषक के साथ सहयोग करने के लिए सहमत हूं और यदि मुझे कष्ट होता है तो मैं उसे तुरंत सूचित करूंगा/करूंगी।

(८) मैंने पिछले ··· .. महीने (माहों) के भीतर किसी भी शोध अध्ययन में भाग नहीं लिया है।

(९) मैं इस तथ्य से अवगत हूं कि मैं किसी भी समय बिना कोई कारण दिए अध्ययन से बाहर निकल सकता हूं और यह अस्पताल में मेरे भविष्य के उपचार को प्रभावित नहीं करेगा।

१०) मुझे यह भी पता है कि जांचकर्ता मेरी सहमति के बिना, किसी भी समय, किसी भी कारण से, अध्ययन में मेरी भागीदारी को समाप्त कर सकते हैं।

(११) मैं जांचकर्ताओं को इस अध्ययन में भाग लेने के परिणामस्वरूप मुझसे प्राप्त जानकारी को प्रायोजकों, नियामक प्राधिकरणों, सरकारी एजेंसियों और नैतिकता समिति को जारी करने की अनुमति देता हूं। मैं समझता हूँ कि वे मेरे मूल अभिलेखों का निरीक्षण कर सकते हैं।

(१२) यदि मेरा डेटा सार्वजनिक रूप से प्रस्तुत किया जाता है तो मेरी पहचान गोपनीय रखी जाएगी।

(१३) यदि, निर्देशों का पालन करने के बावजूद, मुझे अध्ययन योजना में निर्धारित किसी पदार्थ या किसी प्रक्रिया के कारण शारीरिक रूप से नुकसान होता है, [मेरा इलाज जांच स्थल पर मुफ्त किया जाएगा / प्रायोजक सभी खर्च वहन करेगा], अगर वे मेरी बीमा एजेंसी या किसी सरकारी कार्यक्रम या किसी तीसरे पक्ष द्वारा कवर नहीं हैं।

(१४) मैंने अपने सवालों के जवाब अपनी संतुष्टि के रूप में दिए हैं ।

(१५) मैंने शोध अध्ययन में शामिल होने का फैसला किया है।

मुझे पता है, कि यदि इस अध्ययन के दौरान मेरे कोई प्रश्न हैं, तो मुझे ऊपर सूचीबद्ध किसी एक पते पर संपर्क करना चाहिए। से इस सहमति पर हस्ताक्षर करके, मैं प्रमाणित करता हूँ कि इस दस्तावेज़ में दी गई जानकारी मुझे इस सहमति दस्तावेज़ की एक प्रति दी जाएगी।

दिनांक: प्रतिभागी के हस्ताक्षर:

जगह:

प्रतिभागी का नाम:

पूरा डाक पता:

प्रमुख अन्वेषक के हस्ताक्षर:

तिथि:

जगह:

यह प्रमाणित करना है कि उपरोक्त सहमति मेरी उपस्थिति में प्राप्त की गई है।

गवाह के हस्ताक्षर

नाम:

पता:

Annexure-V:

PATIENT INFORMATION SHEET (English)

Department of Orthoapaedics

All India Institute of Medical Sciences, Jodhpur

PATIENT INFORMATION SHEET TITLE:

"**CORRELATION OF FUNCTIONAL OUTCOME EVALUATION SCORES IN TOTAL KNEE ARTHROPLASTY PATIENTS**"

This study requires detailed musculoskeletal examination as well as examination of the Knee & Lower limb by Physical Examination with the pure intention of your health benefit. The expected duration of your stay in OPD, Department of Orthopaedics, AIIMS, Jodhpur will be about 30 minutes. You are expected to attend to all the questions put in front of you in the form of Questionnaire depending on the mutual comfort of you and the investigator. There are no obvious, expected or known adverse effects on the patient due to this study. You have been invited to take part in a study, which will help us in better understanding the relation between various patient related outcomes, deciding which one is the best one. This study may also help establishing a protocol for evaluating ideal score for patients who underwent TKA. You are free to withdraw from the study at any time and this will not have any negative implication on your future treatment in the hospital. Contact Person for further queries.

Dr. G Lakshmi Prasad

+91- 9346846259

Annexure-VI:

PATIENT PERFORMA

1. NAME:

2. AGE:

3. SEX:

4. ADDRESS:

5. IP NO / REG NO:

6. HISTORY: Duration of symptoms Any h/o trauma Any other co morbidities Any treatment taken earlier for the same complaints

6. DATE AND TIME PATIENT SEEN IN OUR HOSPITAL:

7. ANY FORM OF CONSERVATIVE TREATMENT GIVEN IN OUR HOSPITAL:

8. LOCAL EXAMINATION:

a) LIMB INVOLVED

b) SWELLING

c) DEFORMITY

d) TENDERNESS

e) LOCAL RISE IN TEMPERATURE

f) CREPITUS

g) PATELLAR TAP

h) VASCULAR STATUS: PERIPHERAL CIRCULATION –DPA, ATA, PTA.

SCORING –

KNEE SOCIETY SCORE (KSS)

WHO QUALITY OF LIFE SCORE (WHOQOL)

SF-36

PCS

FJS 6

FJS 12

RANGE OF MOTION

VISUAL ANALOGUE SCORE (VAS)

Annexure-VII

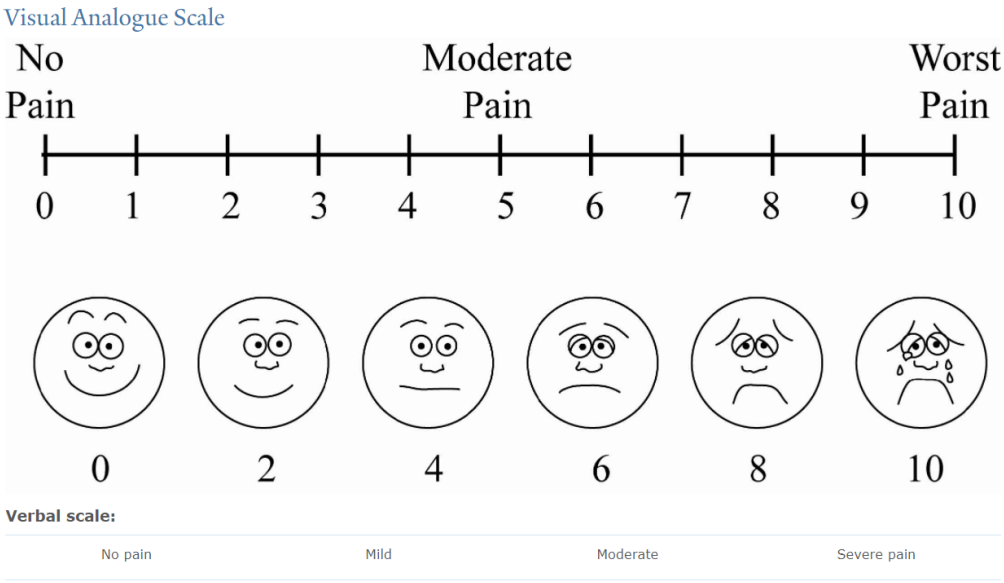
Visual analogue scale

Name:

Age:

Hospital Registration No:

Patient score



Patient Signature

Investigator Signature

घुटना प्रश्नावली (भुलाये गए जोड़ का हिसाब – **12**)

एक स्वस्थ जोड ऐसा नही होता है जिसके बारेमें रोज़-मर्रा की ज़िन्दगी में आप जागरुक होते हों। हालांकि, छोटी से छोटी समस्याएं भी जोड के प्रति आपकी जागरूकता बढ़ा सकती है। इसका मतलब है कि आप अपने जोड़ के बारे में सोचते हैं या इसकी तरफ आपका ध्यान आकर्षित होता है। निम्नलिखित प्रश्न आप रोजमर्रा की जिंदगी में अपने प्रभावित घुटने **के जोड़ के बारे में कितनी बार जागरुक हुए** इससे संबंधित हैं।

आपसे जानकारी लेंगे की आप अपनी रोज़मर्रा की ज़िन्दगी में अपने प्रभावित घुटने के जोड़ के बारे में कितने सचेत है।

कृपया प्रत्येक प्रश्न के लिए सबसे उपयुक्त उत्तर चुनें।

	क्या आप अपने घुटने के जोड़ के प्रति जागरूक होते हैं...	**कभी नही**	**लगभग कभीनही**	**कभी कभार**	**कभी कभी**	**अधिकतर**
1.	... रात को बिस्तर में?	O	O	O	O	O
2.	... जब आप एक घंटे से अधिक समय तक कुर्सी पर बैठे रहते हैं?	O	O	O	O	O
3.	... जब आप 15 मिनट से अधिक समय तक चल रहे होते हैं?	O	O	O	O	O
4.	... जब आप स्नान/शावर ले रहे होते हैं?	O	O	O	O	O
5.	... जब आप कार में सफर कर रहे होते हैं?	O	O	O	O	O
6.	... जब आप सीढ़िया चढ़ रहे होते हैं?	O	O	O	O	O
7.	... जब आप असमान ज़मीन पर चल रहे होते हैं?	O	O	O	O	O
8.	... जब आप निचले स्तर पर बैठी हुई स्थितीसे उठ रहे होते हैं?	O	O	O	O	O
9.	... जब आप लम्बे समय तक खड़े रहते है?	O	O	O	O	O
10.	... जब आप घर का काम या बागवानी कर रहे होते हैं?	O	O	O	O	O
11.	... जब आप पैदल चलते हैं या एक लम्बी पैदल यात्रा कर रहे होते हैं?	O	O	O	O	O
12.	... जब आप अपना पसंदीदा खेल खेल रहे होते हैं?	O	O	O	O	O

Knee Questionnaire (Forgotten Joint Score - 12)

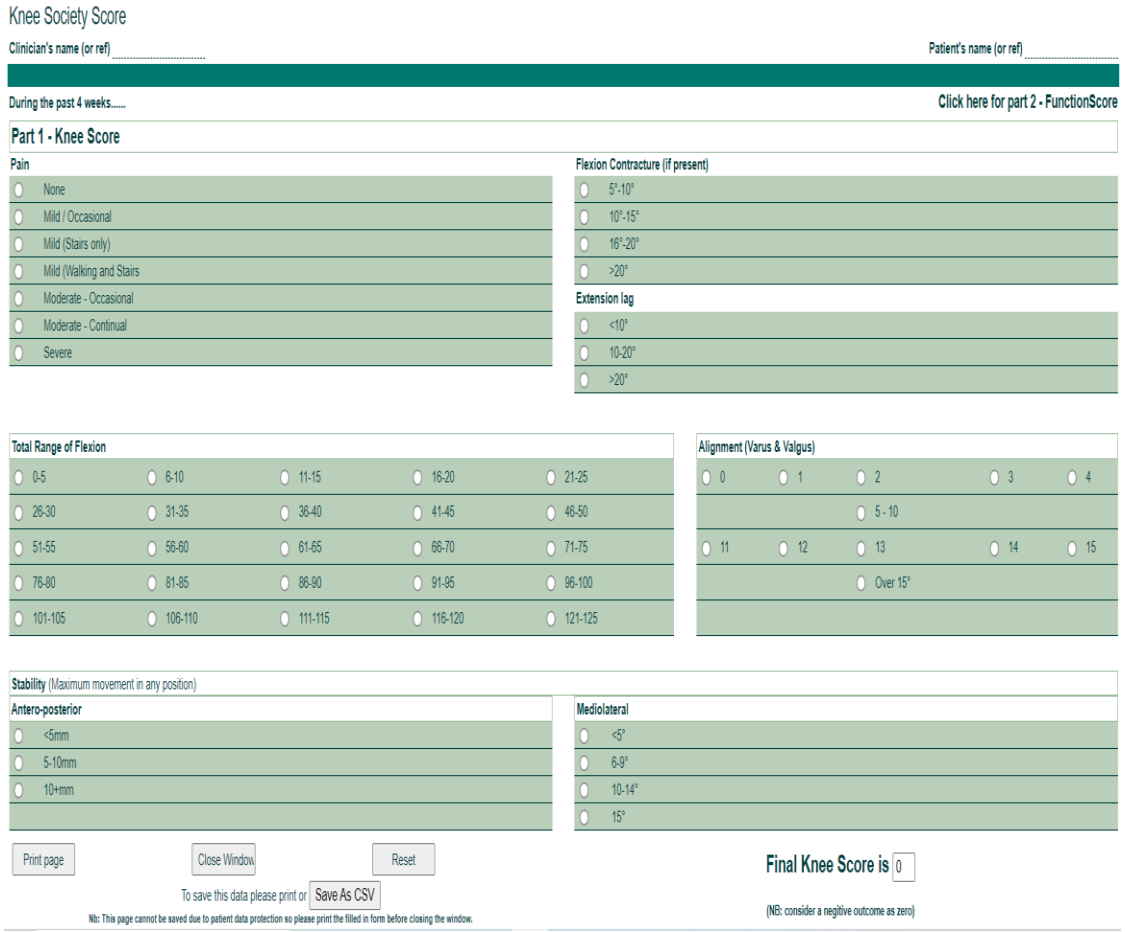
Patient: _____ Date: ___.___._____

A healthy joint is not something you are aware of in everyday life. However, even the smallest problems can raise one's awareness of a joint. This means that you think of your joint or have your attention drawn to it. The following questions concern **how often you are aware of your affected knee joint in everyday life.**

Please choose the most appropriate answer for each question.

	Are you aware of your knee joint…	**Never**	**Almost never**	**Seldom**	**Some-times**	**Mostly**
1.	… in bed at night?	O	O	O	O	O
2.	… when you are sitting on a chair for more than one hour?	O	O	O	O	O
3.	… when you are walking for more than 15 minutes?	O	O	O	O	O
4.	… when you are taking a bath/shower?	O	O	O	O	O
5.	… when you are traveling in a car?	O	O	O	O	O
6.	… when you are climbing stairs?	O	O	O	O	O
7.	… when you are walking on uneven ground?	O	O	O	O	O
8.	… when you are standing up from a low-sitting position?	O	O	O	O	O
9.	… when you are standing for long periods of time?	O	O	O	O	O
10.	… when you are doing housework or gardening?	O	O	O	O	O
11.	… when you are taking a walk/hiking?	O	O	O	O	O
12.	… when you are doing your favorite sport?	O	O	O	O	O

ANNEXURE



Knee Society Score

Clinician's name (or ref) ..... Patient's name (or ref) .....

During the past 4 weeks..... Click here for part 2 - FunctionScore

Part 1 - Knee Score

Pain

- None
- Mild / Occasional
- Mild (Stairs only)
- Mild (Walking and Stairs
- Moderate - Occasional
- Moderate - Continual
- Severe

Flexion Contracture (if present)

- 5°-10°
- 10°-15°
- 16°-20°
- >20°

Extension lag

- <10°
- 10-20°
- >20°

Total Range of Flexion

0-5	6-10	11-15	16-20	21-25
26-30	31-35	36-40	41-45	46-50
51-55	56-60	61-65	66-70	71-75
76-80	81-85	86-90	91-95	96-100
101-105	106-110	111-115	116-120	121-125

Alignment (Varus & Valgus)

0	1	2	3	4
		5 - 10		
11	12	13	14	15
		Over 15°		

Stability (Maximum movement in any position)

Antero-posterior

- <5mm
- 5-10mm
- 10+mm

Mediolateral

- <5°
- 6-9°
- 10-14°
- 15°

Print page Close Window Reset

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Nb: This page cannot be saved due to patient data protection so please print the filled in form before closing the window.

Final Knee Score is 0

(NB: consider a negitive outcome as zero)

Knee Society Score - Function

Clinician's name (or ref) ..... **Patient's name (or ref)** .....

Please answer the following questions.

Part 2 - Function

Walking

- ○ Unlimited
- ○ >10 blocks
- ○ 5-10 blocks
- ○ <5 blocks
- ○ Housebound
- ○ Unable

Stairs

- ○ Normal Up and down
- ○ Normal Up down with rail
- ○ Up and down with rail
- ○ Up with rail, down unable
- ○ Unable

Walking aids used

- ○ None used
- ○ Use of Cane/Walking stick deduct
- ○ Two Canes/sticks
- ○ Crutches or frame

Function Score (Knee Society Score) is 0 (NB: consider a negative outcome as zero)

Print page Close Window Reset

To save this data please print or Save As CSV

Nb: This page cannot be saved due to patient data protection so please print the filled in form before closing the window.

PCS

Client No.: _____ Age: _____ Sex: M(__) F(__) Date: _____

Everyone experiences painful situations at some point in their lives. Such experiences may include headaches, tooth pain, joint or muscle pain. People are often exposed to situations that may cause pain such as illness, injury, dental procedures or surgery.

We are interested in the types of thoughts and feelings that you have when you are in pain. Listed below are thirteen statements describing different thoughts and feelings that may be associated with pain. Using the following scale, please indicate the degree to which you have these thoughts and feelings when you are experiencing pain.

0 – not at all **1** – to a slight degree **2** – to a moderate degree **3** – to a great degree **4** – all the time

When I'm in pain …

1. ☐ I worry all the time about whether the pain will end.
2. ☐ I feel I can't go on.
3. ☐ It's terrible and I think it's never going to get any better.
4. ☐ It's awful and I feel that it overwhelms me.
5. ☐ I feel I can't stand it anymore.
6. ☐ I become afraid that the pain will get worse.
7. ☐ I keep thinking of other painful events.
8. ☐ I anxiously want the pain to go away.
9. ☐ I can't seem to keep it out of my mind.
10. ☐ I keep thinking about how much it hurts.
11. ☐ I keep thinking about how badly I want the pain to stop.
12. ☐ There's nothing I can do to reduce the intensity of the pain.
13. ☐ I wonder whether something serious may happen.

… Total

WHO/MSA/MNH/PSF/97.4
English only
Distr.: Limited

WHOQOL-BREF

PROGRAMME ON MENTAL HEALTH
WORLD HEALTH ORGANIZATION
GENEVA

For office use only

	Equations for computing domain scores	Raw score	Transformed scores*	
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=	**4-20**	**0-100**
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

* Please see Table 4 on page 10 of the manual, for converting raw scores to transformed scores.

ABOUT YOU

Before you begin we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

What is your **gender**? Male Female

What is you **date of birth**? _____ / _____ / _____
Day / Month / Year

What is the highest **education** you received?
None at all
Primary school
Secondary school
Tertiary

What is your **marital status**?
Single Separated
Married Divorced
Living as married Widowed

Are you currently **ill**? Yes No

If something is wrong with your health what do you think it is?_____illness/ problem

Instructions

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.** For example, thinking about the last two weeks, a question might ask:

		Not at all	Not much	Moderately	A great deal	Completely
	Do you get the kind of support from others that you need?	1	2	3	4	5

You should circle the number that best fits how much support you got from others over the last two weeks. So you would circle the number 4 if you got a great deal of support from others as follows.

		Not at all	Not much	Moderately	A great deal	Completely
	Do you get the kind of support from others that you need?	1	2	3	4	5

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

		Very poor	Poor	Neither poor nor good	Good	Very good
1(G1)	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last two weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3 (F1.4)	To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
4(F11.3)	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
5(F4.1)	How much do you enjoy life?	1	2	3	4	5
6(F24.2)	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7(F5.3)	How well are you able to concentrate?	1	2	3	4	5
8 (F16.1)	How safe do you feel in your daily life?	1	2	3	4	5
9 (F22.1)	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
10 (F2.1)	Do you have enough energy for everyday life?	1	2	3	4	5
11 (F7.1)	Are you able to accept your bodily appearance?	1	2	3	4	5
12 (F18.1)	Have you enough money to meet your needs?	1	2	3	4	5
13 (F20.1)	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14 (F21.1)	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

				poor nor good		
15 (F9.1)	How well are you able to get around?	1	2	3	4	5

The following questions ask you to say how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16 (F3.3)	How satisfied are you with your sleep?	1	2	3	4	5
17 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18(F12.4)	How satisfied are you with your capacity for work?	1	2	3	4	5
19 (F6.3)	How satisfied are you with yourself?	1	2	3	4	5
20(F13.3)	How satisfied are you with your personal relationships?	1	2	3	4	5
21(F15.3)	How satisfied are you with your sex life?	1	2	3	4	5
22(F14.4)	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23(F17.3)	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24(F19.3)	How satisfied are you with your access to health services?	1	2	3	4	5
25(F23.3)	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5

Did someone help you to fill out this form?.....

How long did it take to fill this form out?.....

Do you have any comments about the assessment?

.....

.....

THANK YOU FOR YOUR HELP

Table 4 - Method for converting raw scores to transformed scores

DOMAIN 1		
Raw Score	Trasnformed scores	
	4-20	0-100
7	4	0
8	5	6
9	5	6
10	6	13
11	6	13
12	7	19
13	7	19
14	8	25
15	9	31
16	9	31
17	10	38
18	10	38
19	11	44
20	11	44
21	12	50
22	13	56
23	13	56
24	14	63
25	14	63
26	15	69
27	15	69
28	16	75
29	17	81
30	17	81
31	18	88
32	18	88
33	19	94
34	19	94
35	20	100

DOMAIN 2		
Raw score	Trasnformed scores	
	4-20	0-100
6	4	0
7	5	6
8	5	6
9	6	13
10	7	19
11	7	19
12	8	25
13	9	31
14	9	31
15	10	38
16	11	44
17	11	44
18	12	50
19	13	56
20	13	56
21	14	63
22	15	69
23	15	69
24	16	75
25	17	81
26	17	81
27	18	88
28	19	94
29	19	94
30	20	100

DOMAIN 3		
Raw score	Transformed scores	
	4-20	0-100
3	4	0
4	5	6
5	7	19
6	8	25
7	9	31
8	11	44
9	12	50
10	13	56
11	15	69
12	16	75
13	17	81
14	19	94
15	20	100

DOMAIN 4		
Raw score	Transformed scores	
	4-20	0-100
8	4	0
9	5	6
10	5	6
11	6	13
12	6	13
13	7	19
14	7	19
15	8	25
16	8	25
17	9	31
18	9	31
19	10	38
20	10	38
21	11	44
22	11	44
23	12	50
24	12	50
25	13	56
26	13	56
27	14	63
28	14	63
29	15	69
30	15	69
31	16	75
32	16	75
33	17	81
34	17	81
35	18	88
36	18	88
37	19	94
38	19	94
39	20	100
40	20	100

SF 36 SCORE

1. In general, would you say your health is:

☑ Excellent (1)	☐ Very good (2)	☐ Good (3)	☐ Fair (4)	☐ Poor (5)

2. **Compared to one year ago**, how would you rate your health in general **now**?

☑ Much better than one year ago (1)	☐ Somewhat better than one year ago (2)	☐ About the same (3)	☐ Somewhat worse now than one year ago (4)	☐ Much worse than one year ago (5)

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports.

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

5. Lifting or carrying groceries

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

6. Climbing **several** flights of stairs.

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

7. Climbing **one** flight of stairs.

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

8. Bending, kneeling, or stooping

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

9. Walking **more than a mile**

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

10. Walking **several blocks**

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

11. Walking **one block**

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

12. Bathing or dressing yourself.

☐ Yes, limited a lot (1)	☐ Yes, limited a little (2)	☑ No, not limited at all (3)

During the past **4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health?**

13. Cut down the **amount of time** you spent on work or other activities.

☐ Yes (1)	☑ No (2)

14. **Accomplished less** than you would like

☐ Yes (1)	☑ No (2)

15. **Were limited in the kind** of work or other activities.

☐ Yes (1)	☑ No (2)

16. Had **difficulty** performing the work or other activities (for example, it took extra effort).

☐ Yes (1)	☑ No (2)

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

17. Cut down the **amount of time** you spent on work or other activities.

☐ Yes (1)	☑ No (2)

18. **Accomplished less** than you would like.

☐ Yes (1)	☑ No (2)

19. Didn't do work or other activities as **carefully** as usual.

☐ Yes (1)	☑ No (2)

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

☑ Not at all (1)	☐ Slightly (2)	☐ Moderately (3)	☐ Quite a bit (4)	☐ Extremely (5)

21. How much **bodily** pain have you had during the **past 4 weeks**?

☑ None (1)	☐ Very mild (2)	☐ Mild (3)	☐ Moderate (4)	☐ Severe (5)	☐ Very severe (6)

22. During the **past 4 weeks**, how much did pain interfere with your normal work (including both work outside the home and housework)?

☑ Not at all (1)	☐ A little bit (2)	☐ Moderately (3)	☐ Quite a bit (4)	☐ Extremely (5)

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

23. Did you feel full of pep?

☑ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☐ None of the time (6)

24. Have you been a nervous person?

☐ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☑ None of the time (6)

25. Have you felt so down in the dumps that nothing could cheer your up?

☐ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☑ None of the time (6)

26. Have you felt calm and peaceful?

☑ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☐ None of the time (6)

27. Did you have a lot of energy?

☑ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☐ None of the time (6)

28. Have you felt downhearted and blue?

☐ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☑ None of the time (6)

29. Did you feel worn out?

☐ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☑ None of the time (6)

30. Have you been a happy person?

☑ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☐ None of the time (6)

31. Did you feel tired?

☐ All of the time (1)	☐ Most of the time (2)	☐ A good bit of the time (3)	☐ Some of the time (4)	☐ A little of the time (5)	☑ None of the time (6)

32. During the past **4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

☐ All of the time (1)	☐ Most of the time (2)	☐ Some of the time (3)	☐ A little of the time (4)	☑ None of the time (5)

How TRUE or FALSE is **each** of the following statements for you.

33. I seem to get sick a little easier than other people

☐ Definitely true (1)	☐ Mostly true (2)	☐ Don't know (3)	☐ Mostly false (4)	☑ Definitely false (5)

34. I am as healthy as anybody I know

☑ Definitely true (1)	☐ Mostly true (2)	☐ Don't know (3)	☐ Mostly false (4)	☐ Definitely false (5)

35. I expect my health to get worse

☐ Definitely true (1)	☐ Mostly true (2)	☐ Don't know (3)	☐ Mostly false (4)	☑ Definitely false (5)

36. My health is excellent

☑ Definitely true (1)	☐ Mostly true (2)	☐ Don't know (3)	☐ Mostly false (4)	☐ Definitely false (5)

S.No.	NAME	AGE	SEX	DIAGONSIS	PROCEDURE	KSS	KFS	PCS	FORGOTTEN JOINT SCORE(6MONTHS)	FORGOTTEN JOINT SCORE(12 MONTHS)	WHO QOLPHYSICAL 1	WHO QOL-PSYCHOLOGICAL	WHO QOL SOCIAL1	WHO QOL ENVIRONMENTAL 1	SF-36 AT 6 MONTHS(PHYSICAL)	SF-36(ROLE LIMITATION DUE TO PHYSICAL HEALTH)	SF-36(ROLE LIMITATION DUE TO EMOTIONAL PROBLEMS	SF-36(ENERGY)	SF-36(EMOTIONAL WELL BEING)	SF-36(SOCIAL FUNCTIONING)	SF-36(GENERAL HEALTH)	SF-36(PAIN)	SF-36(HEALTH CHANGE)	VAS	ROM
1	Takhat Singh Chundawat	62	M	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee arthroplasty Right side.	80	90	0	75	90	75	69	94	88	65	100	100	90	88	100	90	100	100	2	110
2	Prem Dutt Ozha	69	M	Bilateral Osteoarthritis Knee (Left>Right) (KL Grade IV)	Total knee arthroplasty Left side.	70	90	1	78	75	69	75	100	88	75	75	66.7	85	92	75	100	77.5	75	0	120
3	Mag Singh	56	M	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty	71	90	7	70	82	75	81	75	81	85	100	66.7	95	80	87.5	85	75	100	0	120
4	ROOP KUMAR	78	M	Bilateral Osteoarthritis Knee (KL Grade IV) left >right	Total knee arthroplasty left side	75	100	6	85	80	56	56	100	69	65	75	100	90	88	87.5	95	70	75	2	120
5	Santosh Mehta	71	M	Bilateral Osteoarthritis Knee with PFN in situ left side(K L grade4)	Bilateral Total knee arthroplasty	74	80	5	90	95	56	69	100	75	65	100	66.7	100	92	100	90	87.5	100	2	120
6	Ghanshyam Ladda	55	M	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty.	83	90	3	85	88	63	69	94	81	70	75	100	90	76	62.5	90	80	75	0	120
7	Izhar Ahmed	64	M	Bilateral Osteoarthritis Knee	Right side Total knee arthroplasty	79	90	2	100	100	69	75	81	75	75	75	100	85	72	75	85	90	100	0	120
8	Vimla Jain	67	M	Bilateral Osteoarthritis Knee (KL Grade IV) (Right >Left)	Total knee arthroplasty Right side.	86	90	6	76	94	81	81	100	63	85	100	100	80	60	87.5	95	100	75	0	120
9	Kanhaiyalal Rathi	74	M	B/L Osteoarthritis Knee (Left>Right) (KL Grade IV).	Left side Total knee replacement.	78	100	3	84	90	63	88	94	75	60	75	100	75	64	75	95	77.5	100	0	120
10	Mahendra Kumar Sharma	56	M	B/L Osteoarthritis Knee (Right > Left) (KL Grade IV)	Right Total knee replacement.	84	100	4	100	100	81	63	75	81	65	50	100	70	68	50	90	75	100	0	120
11	Nasim	45	M	Osteoarthritis bilateral Knee (KL Grade IV).	Total knee replacement right side.	82	90	1	80	85	69	63	75	69	100	75	100	70	72	100	85	67.5	75	0	110
12	Om Prakash Kumawat	62	M	Bilateral Osteoarthritis Knee (KL Grade IV) (Left> Right)	Bilateral Total knee arthroplasty	89	90	5	65	93.5	69	56	94	94	85	100	66.7	75	76	87.5	75	80	100	0	120
13	Takhat Singh Chundawat	62	M	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee arthroplasty Right side.	88	95	2	68	94	63	69	75	94	75	75	100	85	80	100	70	70	100	0	120
14	Prem Dutt Ozha	69	M	Bilateral Osteoarthritis Knee (Left>Right) (KL Grade IV)	Total knee arthroplasty Left side.	86	95	1	72	96	63	69	69	81	80	75	100	70	84	75	65	90	100	0	120
15	PANNA LAL SEN	68	M	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty	88	90	7	62	99	69	81	100	94	95	75	100	65	88	62.5	70	100	100	0	120
16	JAMALUDIN	70	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Total knee arthroplasty right side.	89	100	6	66	94	69	69	94	88	90	75	100	70	92	75	75	87.5	75	0	120
17	HIRA LAL	74	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	92	100	7	62	78	88	88	75	88	85	100	100	75	100	87.5	80	77.5	100	2	100
18	NANDKISHORE CHANDAK	60	M	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee replacement right side.	78	85	5	63	83	81	75	94	63	75	100	66.7	80	64	62.5	85	100	100	0	120
19	Takhat Singh Chundawat	62	M	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee arthroplasty LEFT side.	80	80	8	66.5	98	81	69	81	63	90	100	100	85	92	100	90	90	100	0	120
20	Panna Lal Sen	68	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	90	100	4	72	94	63	75	100	81	75	100	100	95	88	87.5	95	80	75	0	120
21	Jamaluddin	70	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Right Total Knee Arthroplasty	94	100	5	64	73	63	50	75	88	65	100	100	90	76	75	100	70	100	0	120
22	Suraj Prakash Trivedi	72	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	78	90	0	62	98.5	63	69	75	75	90	75	100	95	72	87.5	95	87.5	100	0	120
23	Satya Narayan Tailor	51	M	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	87	90	5	64	84	56	75	94	94	75	100	100	75	68	100	90	77.5	100	0	120
24	Salaj Mathur	61	M	Bilateral osteoarthritis knee	Left Total knee Arthroplasty	96	100	3	68	80	69	81	75	81	95	75	66.7	100	64	75	85	70	75	0	120
25	Gopa Ram	70	M	Bilateral Osteoarthritis Knee (KL grade 4)	Right side Unicondylar Knee Arthroplasty a	80	95	4	74	86.5	75	44	81	75	90	100	66.7	85	72	75	75	100	100	0	120
26	Sawai Ram	56	M	Right Osteoarthritis of knee(KL grade 4)	Right Total Knee Arthroplasty	88	100	3	77	78	81	50	100	88	90	75	66.7	75	80	87.5	70	90	100	0	120
27	Nemichand Parihar	63	M	Bilateral Osteoarthritis Knee (KL grade 4)	Right Total knee arthroplasty.	90	85	6	68	95.5	69	50	75	81	95	75	66.7	70	84	87.5	70	80	75	0	120
28	Wazeer Ali	75	M	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Left Total knee Arthroplasty	90	90	3	63	88	56	56	81	75	80	75	66.7	65	88	75	85	70	100	0	100
29	Rajendra Kumar Sharma	54	M	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	92	100	7	64	95.5	63	63	94	88	90	75	66.7	70	84	62.5	95	77.5	75	0	120
30	Mo. Ahasan	70	M	Bilateral Osteoarthritis Knee (KL grade IV)	Left Total knee Arthroplasty	91	100	8	66	97.5	69	69	100	100	80	75	66.7	75	80	62.5	100	87.5	100	0	120
31	Raj Kumar Gupta	68	M	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	98	95	5	70	99.5	81	56	94	88	85	75	66.7	85	92	62.5	85	70	100	0	120
32	Madhu Borana	49	M	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	96	100	4	68.5	95	69	63	94	88	90	75	66.7	90	96	75	90	77.5	100	0	120
33	Sumer S k Kachhawaha	68	M	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	96	100	5	72	100	63	75	100	94	100	75	66.7	85	92	75	100	80	100	0	120
34	Radha Devi Bhati	59	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty	74	65	4	74	90	88	56	75	88	85	100	66.7	85	88	75	95	100	100	0	120
35	Asha Sharma	61	F	Bilateral Osteoarthritis Knee [K.L grade 4] (Left>Right)	Total knee arthroplasty Left side	78	70	7	78	80	94	81	94	81	80	100	66.7	100	88	75	90	90	100	2	120
36	Santosh Kumari Jain	67	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	77	65	6	81	80	88	88	100	75	75	75	66.7	85	88	87.5	85	87.5	100	0	120
37	Rita Patel	51	F	Bilateral Osteoarthritis Knee [K.L grade 4](left >right)	Total knee arthroplasty left side	73	80	8	80	88	75	69	75	81	100	75	66.7	75	84	100	85	80	100	0	120
38	Chukiya Devi	67	F	Bilateral osteoarthritis of knee (right>left)	Total knee arthroplasty right side	74	80	2	78	95	69	63	81	81	70	75	66.7	100	80	87.5	80	77.5	100	0	120
39	Sita devi	65	F	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee arthroplasty Right side.	76	90	6	75	80	63	88	69	75	80	75	66.7	70	76	75	85	70	75	0	110
40	MADHU MEHTA	64	F	Bilateral Osteoarthritis Knee (KL Grade IV) left >right	Total knee arthroplasty left side	72	90	8	77	84	81	81	75	75	95	100	66.7	85	72	75	95	80	100	0	120
41	Sharda Dave	61	F	Bilateral Osteoarthritis Knee (left > right).	Left side Total knee arthroplasty	77	80	5	83	85	88	63	94	69	90	100	66.7	95	68	62.5	90	90	100	0	120
42	Champa Sharma	62	F	Bilateral Osteoarthritis Knee(K L grade IV)	Bilateral Total knee arthroplasty.	87	90	4	75	90	50	63	100	81	70	100	66.7	95	64	75	95	100	100	0	120
43	Manju Devi	50	F	Bilateral Rheumatoid arthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty.	85	80	5	79	100	69	81	75	69	65	75	66.7	85	60	87.5	85	100	100	0	120
44	Rajkumari Bhati	60	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty	78	80	8	75	79	88	63	75	75	90	75	66.7	75	80	100	90	77.5	100	0	110
45	Anee Singh	62	F	B/L Osteoarthritis Knee (Right > Left) (KL Grade IV).	Right Total knee replacement.	77	90	7	74	68	69	69	56	69	80	75	66.7	100	84	87.5	80	87.5	100	0	120
46	Bhuri Devi	47	F	OA left knee (K L Grade IV)	Total knee arthroplasty left side	81	90	6	84	94	88	81	81	81	65	75	66.7	100	88	75	80	80	100	0	120
47	Hava Kanwar	42	F	Rheumatoid Arthritis of bilateral knee (right >left).	Total knee arthroplasty Right side.	87	90	2	82	92	75	69	100	81	70	100	66.7	85	92	87.5	80	90	75	0	120
48	Seema Solanki	50	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty.	86	80	3	72	85	69	75	81	75	75	100	66.7	75	100	75	70	77.5	100	0	120
49	Rekha Mehta	60	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty.	79	80	5	78	85	81	81	75	88	70	100	66.7	80	92	62.5	75	67.5	100	0	120
50	Mohini chopra	62	F	Bilateral Osteoarthritis Knee (KL Grade IV) (Right >Left)	Total knee arthroplasty Right side	80	100	6	77	86.5	56	81	69	88	75	100	66.7	90	88	100	65	62.5	100	0	120
51	Pushpa devi	72	F	OA left knee in operated case of right TKR	Total knee arthroplasty left side.	88	90	7	82	85.5	63	63	75	75	85	75	66.7	95	84	87.5	75	77.5	100	0	120
52	Kamla Singhvi	66	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Total knee arthroplasty left side.	79	90	8	81	87	63	69	94	75	80	100	66.7	100	84	75	75	87.5	75	0	120
53	Aleyara Bibi	61	F	Bilateral Osteoarthritis Knee (KL Grade IV) (Left> Right)	Total knee arthroplasty left side	75	100	9	79	93.5	69	81	94	69	85	75	66.7	75	84	75	85	70	100	0	120
54	Jayanti Devi	60	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral Total knee arthroplasty	84	90	2	73	69	63	75	100	63	95	100	100	95	72	87.5	100	100	75	0	120
55	Kamli Dewasi	45	F	Osteoarthritis Knee Right side (KL grade IV).	Right Total knee replacement.	88	100	0	100	100	75	69	81	56	90	100	100	85	76	100	95	87.5	75	0	120
56	Kamla Mathur	69	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Left Total knee arthroplasty.	87	90	2	75	79	81	75	94	63	75	100	100	75	76	75	90	77.5	100	0	120
57	Radha Devi Bhati	59	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Bilateral Total knee arthroplasty	88	80	4	68.5	84	88	69	100	63	80	100	100	65	88	87.5	95	75	100	0	120
58	Asha Sharma	61	F	Bilateral Osteoarthritis Knee [K.L grade 4] (Left>Right)	Total knee arthroplasty Left side	96	85	5	68.5	99	94	81	75	50	90	75	100	60	84	62.5	90	65	100	0	110
59	Santosh Kumari Jain	67	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	88	80	6	70.5	90.5	88	81	81	69	90	100	100	75	80	62.5	95	72.5	100	0	120
60	Rita Patel	51	F	Bilateral Osteoarthritis Knee [K.L grade 4](left >right)	Total knee arthroplasty left side	90	85	4	66	95.5	69	69	100	100	65	75	100	65	76	62.5	100	82.5	100	0	120
61	Chukiya Devi	67	F	Bilateral osteoarthritis of knee (right>left)	Total knee arthroplasty right side	82	100	6	67.5	88	56	75	81	88	70	100	100	100	72	75	85	82.5	100	0	120
62	Sita devi	65	F	Bilateral Osteoarthritis Knee (Right>Left) (KL Grade IV)	Total knee arthroplasty Right side.	89	100	3	75	95	69	69	56	88	90	100	100	75	68	87.5	90	85	100	0	120
63	narayani	66	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Total knee arthroplasty	90	90	2	78	93	69	69	81	88	95	75	100	65	64	100	95	87.5	100	0	120
64	SHAHNAZ SAYEED	60	F	Bilateral Osteoarthritis Knee (KL Grade IV)	Total knee arthroplasty	92	85	3	78.5	94	75	63	75	81	80	75	100	70	60	87.5	85	90	100	0	120
65	REKHA DIXIT	67	F	Bilateral Osteoarthritis Knee (KL Grade IV) (Right >Left)	Total knee arthroplasty Right side	96	80	12	75.5	92	63	63	81	88	75	75	100	85	88	75	85	92.5	100	0	120
66	VIMLA JAIN	68	F	Osteoarthritis of left knee in an o/c/o Right Total Knee Arthroplasty	Total Knee Arthroplasty Left side.	86	85	8	73	86	56	75	100	94	75	100	100	80	92	75	90	100	75	0	120
67	SWARNABALA SURANA	54	F	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Total knee arthroplasty left side.	90	100	10	67	80.5	75	81	100	94	95	75	100	95	96	75	95	82.5	100	0	120

68	Usha Sharma	53	F	Bilateral osteoarthritis Knee	Bilateral Total knee arthroplasty	88	85	14	76	88	63	69	75	63	70	75	100	90	88	75	95	75	100	0	120
69	Neetu Devi	60	F	Bilateral Osteoarthrtis knee (KL grade 4)	Bilateral Total knee arthroplasty	90	75	2	80	98	69	75	75	69	65	100	100	85	84	62.5	90	77.5	100	2	120
70	Vimala Jain	53	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Total knee Arthroplasty left side	92	95	0	70.4	96	69	75	94	75	70	100	100	80	80	62.5	95	72.5	100	4	110
71	Shanta Mehta	66	F	Osteoarthritis of right knee in an o/c/o left Total Knee Arthroplasty	Right Total Knee Arthroplasty	96	100	6	65	90	56	81	75	81	85	100	100	90	80	87.5	100	77.5	100	0	120
72	Gulab devi	66	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Left Total Knee arthroplasty	88	95	4	66.5	93	69	81	81	88	85	100	100	95	76	87.5	95	75	100	0	120
73	Bebi	46	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Right Total Knee Arthroplasty	86	90	2	67.5	98	69	75	75	75	95	100	100	100	84	87.5	90	87.5	100	2	120
74	Gyan Nahta	61	F	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Left Total Knee arthroplasty	76	95	1	66	97	69	69	75	75	100	100	100	85	76	100	100	82.5	100	0	120
75	Anju Jailiya	56	F	Osteoarthritis of left knee	Left total knee replacement	86	100	2	65	94	63	75	100	88	85	100	100	85	84	100	95	90	75	2	120
76	Maya Tripathi	54	F	Bilateral oateoarthritis knee	Bilateral Total knee arthroplasty	96	95	7	66	98.5	75	56	56	75	60	75	100	85	88	100	90	100	100	0	110
77	Tulasi Devi	65	F	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Left Total knee Arthroplasty	95	95	7	69	98.6	81	63	69	81	90	50	100	80	92	87.5	85	87.5	100	0	120
78	Sarla Chandak	50	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	93	95	6	66	98	75	56	100	88	95	50	100	80	100	75	85	82.5	100	0	120
79	Brij Mohan Kanwar	51	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	94	95	9	65	95	69	69	75	94	100	50	100	90	96	62.5	95	87.5	100	0	120
80	Manju Goyal	53	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	90	95	10	66	76	81	50	81	94	65	75	100	90	92	87.5	90	90	100	0	120
81	Prem Bapna	73	F	Bilateral Osteoarthritis Knee [K.L grade 4]	Bilateral Total knee arthroplasty	91	100	12	64	88.5	81	69	56	69	85	75	100	90	92	87.5	100	80	100	0	120
82	Gulab Devi	66	F	Bilateral Osteoarthritis Knee (Right >Left) (KL Grade IV)	Left Total knee Arthroplasty	90	90	6	62	79	63	44	69	69	90	75	100	95	96	87.5	95	90	100	0	120
83	Suraj Devi Bishnoi	53	F	Bilateral Rheumatoid arthritis Knee (Right>Left)	Total knee arthroplasty Right side.	88	95	8	59	74.5	75	44	94	75	65	100	100	95	100	87.5	90	80	100	0	120
84	Shakuntala Tatia	58	F	Bilateral Osteoarthritis Knee (KL grade 4)	Right Total knee arthroplasty.	87	96	8	58	94	69	44	50	100	70	100	100	90	88	75	90	70	100	2	120
85	Bharti Goyal	51	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	89	95	10	61	95	44	50	56	63	75	75	100	85	80	100	85	75	100	2	120
86	Ratan Kansara	67	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	85	85	11	69.5	88	81	56	75	81	90	75	100	85	84	100	95	77.5	100	0	120
87	Madhu Borana	49	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	87	90	12	67.5	83	81	63	69	94	85	75	100	90	96	87.5	100	72.5	100	0	110
88	Neera Tak	48	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	85	75	0	66.5	77	69	69	44	88	80	75	100	90	100	62.5	95	87.5	100	0	120
89	Bebi	46	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	89	95	4	72	88	69	69	75	88	95	100	100	80	96	75	85	90	100	0	120
90	Abdul Qayum	69	F	Bilateral Osteoarthritis Knee (KL grade 4)	Left Total knee Arthroplasty	79	100	6	73	93	81	44	100	94	85	100	100	90	92	75	90	90'	100	0	120
91	Indu Bala Khatri	60	F	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Left Total knee Arthroplasty	85	95	6	67	95	81	56	44	94	85	100	100	100	100	100	100	87.5	100	0	120
92	Shanti Chandel	73	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	87	90	7	76	86	75	63	100	69	90	100	66.7	95	88	87.5	85	82.5	75	0	120
93	Rina Devi Parakh	58	F	Bilateral Osteoarthritis Knee (Right >Left) (KL Grade IV)	Right Total knee arthroplasty.	89	90	3	68	68	81	44	75	75	100	100	66.7	90	84	75	90	75	100	0	120
94	Deeksha Abhichandani	56	F	Bilateral Osteoarthritis Knee (KL grade 4)	Bilateral total knee arthroplasty.	92	90	2	69	94	63	56	69	63	80	100	100	90	80	100	90	90	100	0	120
95	Gulab Devi	66	F	Right Osteoarthritis Knee (KL Grade IV) in operated case of left total kne	Left Total knee Arthroplasty	97	95	9	69	100	69	69	81	75	90	100	100	90	96	87.5	95	90	100	2	110
96	Indu Bala Khatri	60	F	Bilateral Osteoarthritis Knee KL grade IV (Left>Right)	Left Total knee Arthroplasty	96	100	5	67.5	88.5	63	69	100	88	95	100	100	90	92	100	85	100	100	0	100