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RESEARCH ARTICLE

THE RELATIONSHIP BETWEEN EMOTIONAL STATUS, PAIN, SEVERITY OF OSTEOARTHRITIS ON RADIOGRAPH AND QUALITY OF LIFE IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Knee Osteoarthritis, Emotions, Pain, Severity

Abstract

Background: By 2050, India's 60 and older population is expected to encompass 323 million people, a number greater than the total US population in 2012. Osteoarthritis is the growing cause of social and economic burden to our aging society. It has been seen psychosocial status of patient with osteoarthritis have an impact on pain, functional ability and quality of life. The emotional status of osteoarthritis patient can have poor outcome on his/her Quality of life making the person disabled in their activities and functions. The majority of osteoarthritis pharmacological and rehabilitation treatments are geared toward alleviating pain due to disease severity in the joint; therefore, it appears important to optimize treatment for people who have pain beyond peripheral sources.

Objective: This study will help to understand the association of emotional status, pain, radiographic severity and quality of life in patients with knee osteoarthritis so that a more holistic approach will be developed towards osteoarthritis.

Methodology: Study design was a cross sectional observational study. 100 subjects were assessed in the study. Participants were included in the study after screening for inclusion and exclusion criteria. All subjects were evaluated according to the assessment proforma for the following Pain on Visual Analogue Scale (VAS), Positive And Negative Affect Scale and Knee function on Knee Injury and Osteoarthritis Outcome Score (KOOS).

Conclusion: The findings of this study suggest an association between emotional status and pain, emotional status and quality of life. But no association is seen between emotional status and Kellgren Lawrence Scale.

Introduction:-

Knee osteoarthritis (OA) is a common degenerative joint disease that affects millions of people worldwide. It is characterized by the progressive loss of cartilage in the knee joint, leading to pain, stiffness, and decreased mobility. While the physical causes of knee OA are well-understood, the relationship between emotions and knee OA is an

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area of growing interest.Research has suggested that emotional factors such as stress, anxiety, and depression may play a role in the development and progression of knee OA. In a study published in the Journal of Psychosomatic Research, researchers found that patients with knee OA who reported higher levels of stress had more severe pain and functional limitations than those who reported lower levels of stress[1]. Additionally, a study in the Journal of Rheumatology found that patients with knee OA who reported higher levels of anxiety had more frequent and severe episodes of pain[2].

One possible explanation for the link between emotions and knee OA is that stress and other negative emotions can increase inflammation in the body. Inflammation is a key factor in the development and progression of knee OA, and studies have shown that stress can increase the production of pro-inflammatory cytokines[3]. Furthermore, a study in the Journal of Pain found that psychological stress can alter pain processing in the brain, leading to increased pain perception[4].Another possible explanation is that negative emotions can lead to a lack of physical activity, which can exacerbate knee OA symptoms. Patients with knee OA who experience depression or anxiety may be less likely to engage in physical activity due to fear of pain or discomfort, leading to decreased joint flexibility and muscle strength[5].

While the relationship between emotions and knee OA is complex, addressing emotional factors may be an important part of managing the disease. One potential strategy is to incorporate mind-body techniques such as meditation and yoga into treatment plans. These techniques have been shown to reduce stress and anxiety, as well as improve pain and function in patients with knee OA[6].In conclusion, the relationship between emotions and knee OA is an area of growing interest. While the exact mechanisms are not yet fully understood, research has suggested that emotional factors such as stress and anxiety may play a role in the development and progression of the disease. Addressing emotional factors through mind-body techniques may be an important part of managing knee OA and improving patient outcomes.

Material and Methods:-

Objective: -

To understand the association of emotional status, pain, radiographic severity and quality of life in patients with knee osteoarthritis so that a more holistic approach is developed towards osteoarthritis

Study design-

cross sectional observational study.

70 subjects presenting with knee pains and having diagnosis of osteoarthritis knee were assessed in the study coming to the OPD setting of a tertiary care hospital for emotional status. All subjects were evaluated according to the assessment proforma consisting of Pain on Visual Analogue Scale (VAS) (Fig. 1) and Positive And Negative Affect Scale (PANAS) (Fig. 2)

Knee function was assessed on Knee Injury and Osteoarthritis Outcome Score (KOOS). (Fig. 3)

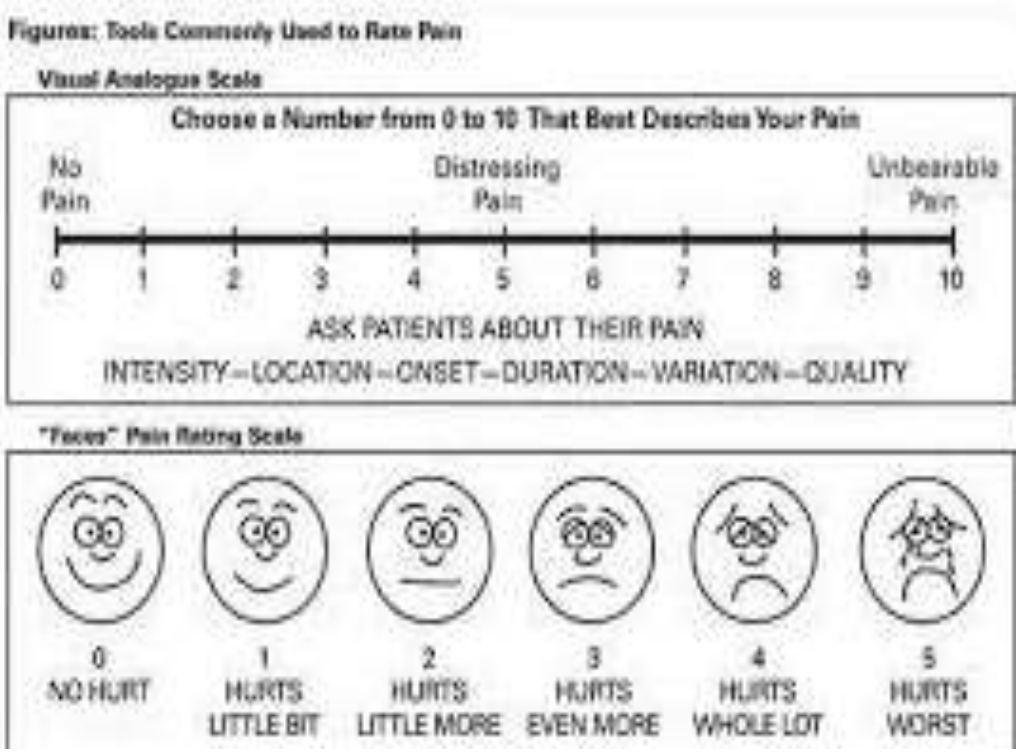


Fig.1- VAS Score

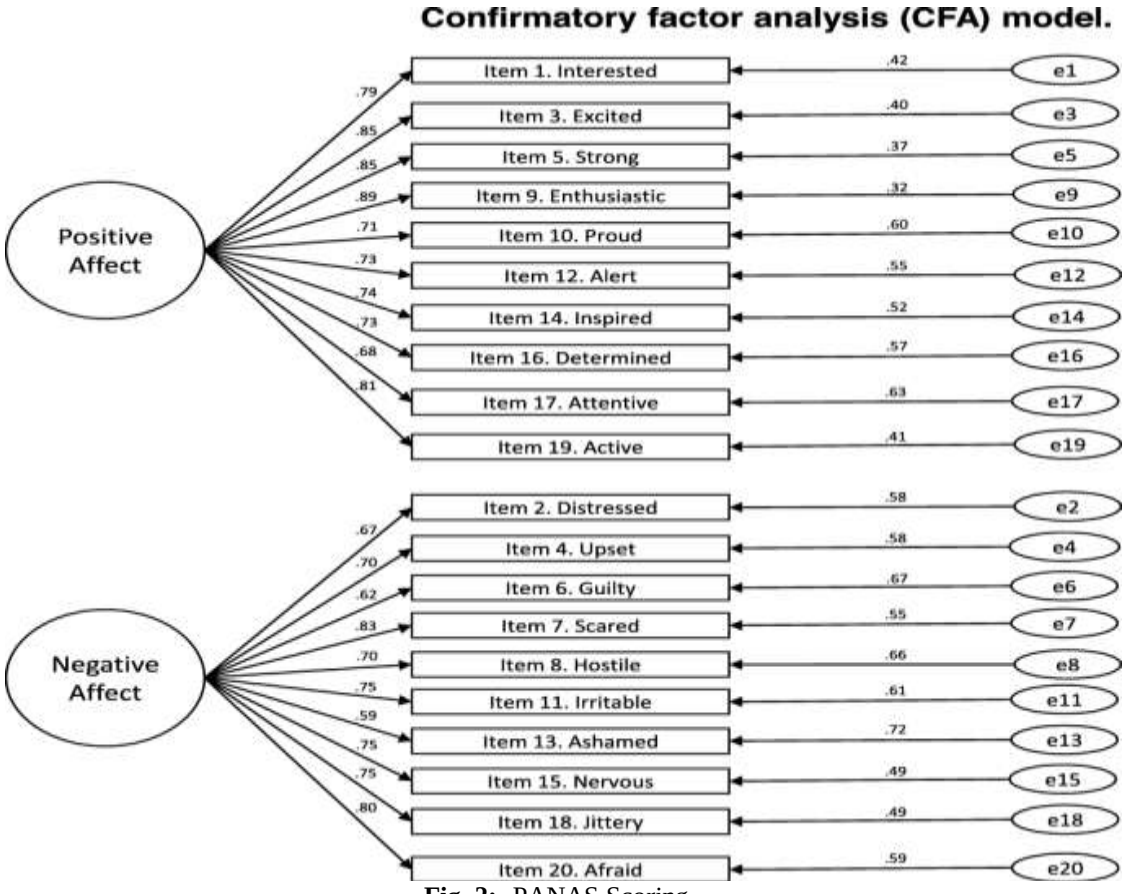


Fig. 2:- PANAS Scoring.

Knee Injury and Osteoarthritis Outcome Score (KOOS)

Pain

P1 How often is your knee painful?	☐ Never	☐ Monthly	☐ Weekly	☐ Daily	☐ Always
What degree of pain have you experienced the last week when…?					
P2 Twisting/pivoting on your knee	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P3 Straightening knee fully	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P4 Bending knee fully	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P5 Walking on flat surface	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P6 Going up or down stairs	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P7 At night while in bed	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P8 Sitting or lying	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
P9 Standing upright	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme

Symptoms

Sy1 How severe is your knee stiffness after first wakening in the morning?	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
Sy2 How severe is your knee stiffness after sitting, lying, or resting later in the day?	☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Extreme
Sy3 Do you have swelling in your knee?	☐ Never	☐ Rarely	☐ Sometimes	☐ Often	☐ Always
Sy4 Do you feel grinding, hear clicking or any other type of noise when your knee moves?	☐ Never	☐ Rarely	☐ Sometimes	☐ Often	☐ Always
Sy5 Does your knee catch or hang up when moving?	☐ Never	☐ Rarely	☐ Sometimes	☐ Often	☐ Always
Sy6 Can you straighten your knee fully?	☐ Always	☐ Often	☐ Sometimes	☐ Rarely	☐ Never
Sy7 Can you bend your knee fully?	☐ Always	☐ Often	☐ Sometimes	☐ Rarely	☐ Never

Fig. 3:- KOOS Score.

Diagnosis of Osteoarthritis was done according to Classic Clinical Criteria (ACR, 1981) which has a sensitivity of 95% and specificity of 69% (Fig. 4)

knee pain plus at least 3 of 6 characteristics:

1. > 50 y/o
2. Morning stiffness < 30 min
3. Crepitus
4. Bony tenderness
5. Bony enlargement
6. No palpable warmth

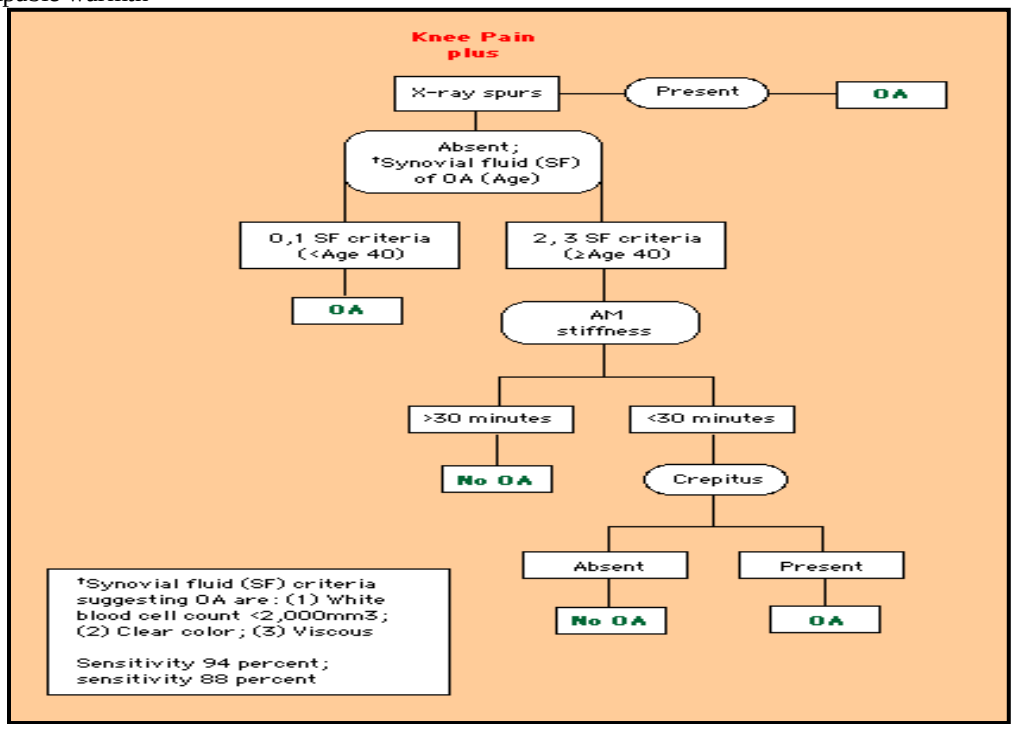


Fig 4:- Diagnostic algorithm for knee OA.

Investigations which were helpful in diagnosis of knee OA are

(a) Synovial fluid examination:
- WBC<2000/mm^3
- Clear color
- High Viscosity
- Subchondral cysts

(b) X-ray findings (Fig 5)
- Osteophytes
- Loss of joint space
- Subchondral sclerosis

Inclusion Criteria-
1. OA according to American College of Rheumatology criteria + minimum Grade 1 on Kellgren Lawrence scale
2. Age group of 45-70 yrs
3. Those willing to participate

Exclusion criteria
1. Prosthetic knee replacement or other clinically significant surgery of the affected knee
2. Any cognitive impairment
3. Rheumatoid arthritis, cancer, joint infection and any other known illness.

Fig 5:- Radiographs of Advanced knee arthritis (KL stage 4).

Results:-

The mean age group was 58.60 ± 9.15 years with maximum age being 78 years and minimum age was 45 years. 63 females and 17 males. Grading of knee osteoarthritis divided according to Kellgren Lawrence Scales as follows: Grade 1- 12, Grade 2- 31, Grade 3- 17, Grade 4- 10 (Fig. 6)

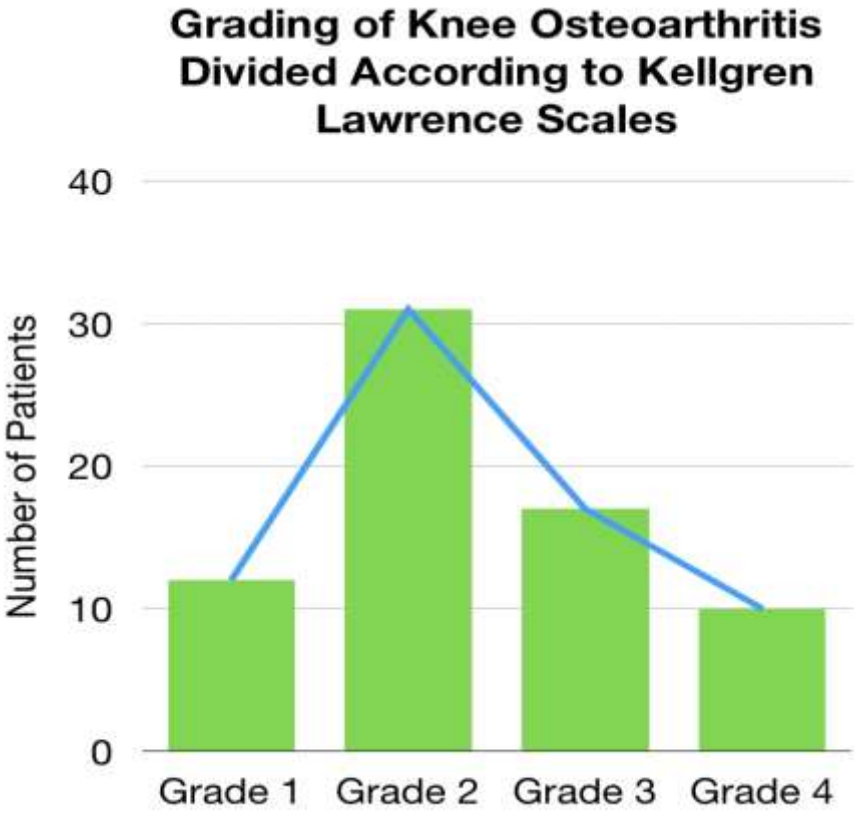


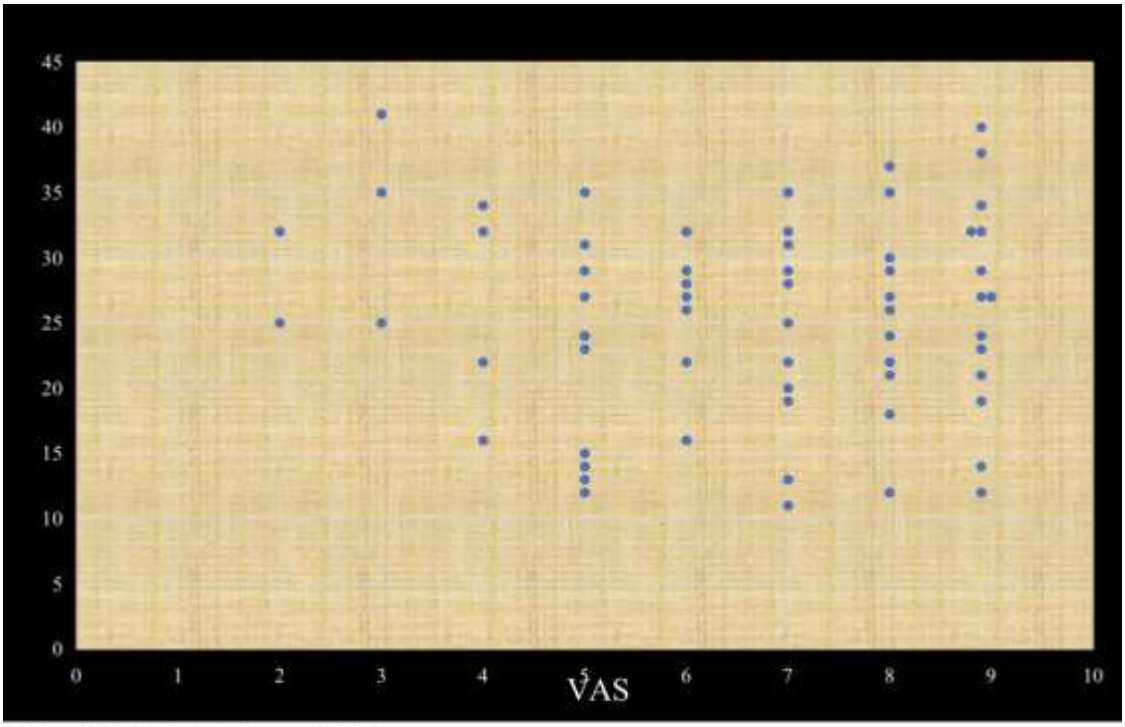
Fig. 6:- Bar Diagram of frequency of Various grades of knee OA.

Data Analysis-

SAS statistical software, version 9.1 (SAS Institute, Inc.) was used to carry out the data analysis. Normality was checked using the Shapiro- Wilk test. The result came out to be negative. Non-parametric tests were used to find out the correlation.

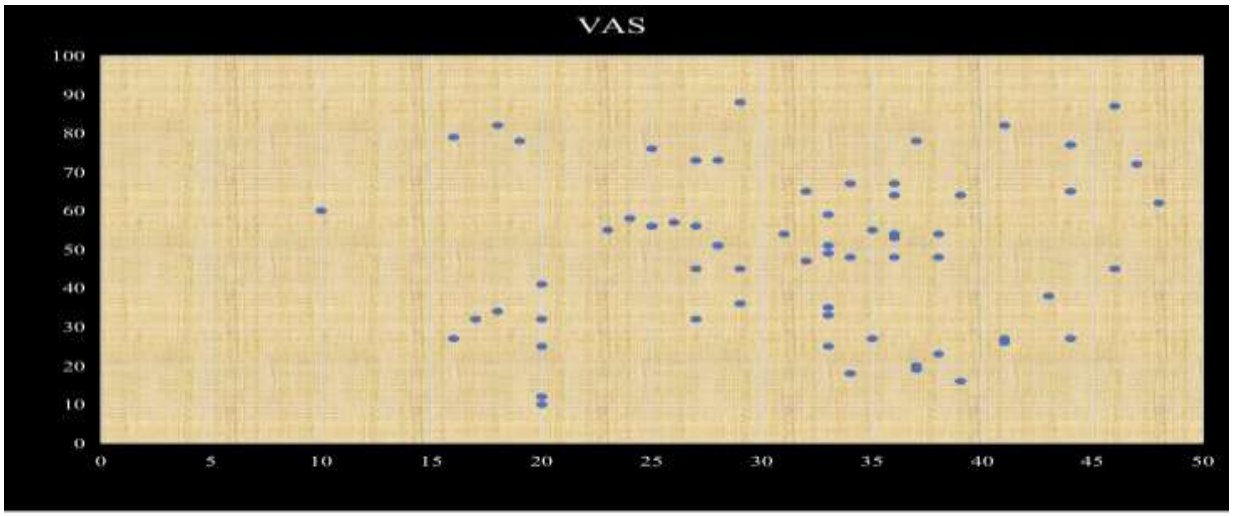
Correlation and Result of Data analysis:-

The relation between positive PANAS and VAS– statistical has significant difference (p=0.018) at 95% with confidence interval of r = -0.27 (i.e., weak negative correlation). This indicates higher positive emotions inhibit pain (fig.7).The relation between Positive PANAS and QOL of KOOS- was r = 0.26, which is weak positive correlation (Fig:9) and the relation between Negative PANAS and KL grade was r =0.03 which is not significant. The relation of Negative PANAS and Pain of KOOS was r = 0.28 indicating weak positive correlation while the relation of Positive PANAS and KL grade stands out to be (r= -0.0045) which is not significant. The Positive PANAS with VAS, KOOS subscale pain, symptoms, ADL's and QOL), Kellgren Lawrence Scale and, The Negative PANAS with VAS, KOOS (subcale pain, symptoms, ADL's and QOL), Kellgren Lawrence Scale using spearman test



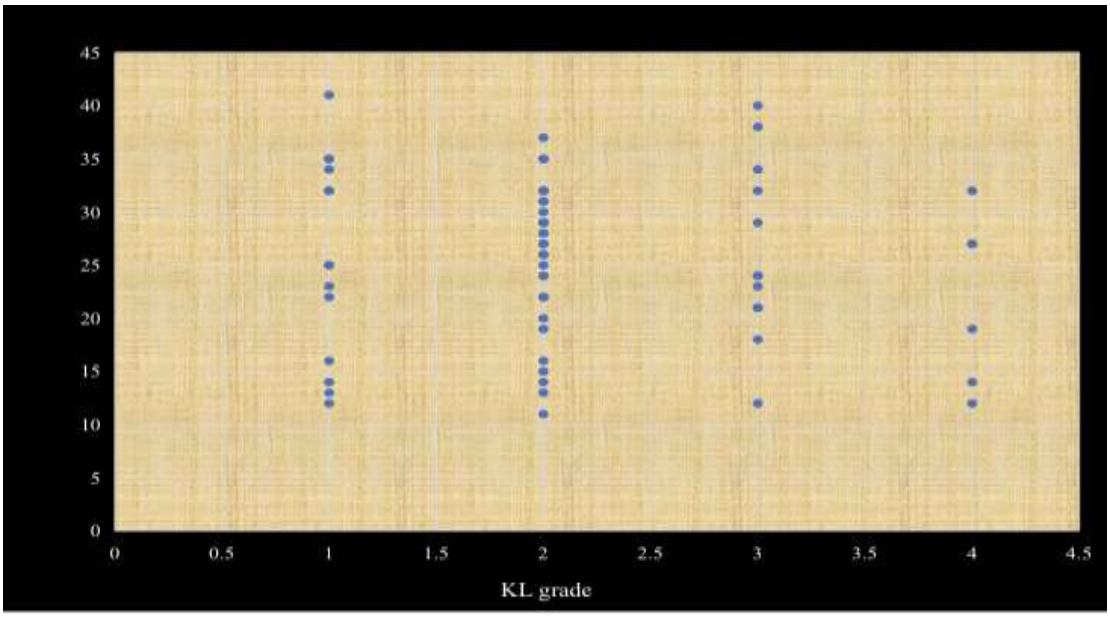
positive panas and vas–
statistical significant difference (p=0.018) at 95% confidence interval
r = -0.27 (weak negative correlation)
This indicates higher positive emotions inhibit pain

Fig 7:-



Positive Panas and QOL of KOOS-
r = 0.26
weak positive correlation

Fig 8:



positive panas and KL grade-
r = -0.12
no correlation

Fig 9:-

Discussion:-

Osteoarthritis is characterized by joint inflammation due to cartilage destruction. It is caused by aging, heredity, and injury from trauma or disease. The characteristic symptoms ispain in the affected joint(s) after repetitive use. There is no blood test for the diagnosis of osteoarthritis. Goal of treatment is to reduce joint pain and inflammation while improving and maintaining joint function. It is a growing cause of social and economic burden. Psychosocial status of patient with osteoarthritis has an impact on the Pain, functional ability and quality of life. The emotional status of osteoarthritis patient can have poor outcome on Quality of life making the person disabled in their activities and functions.

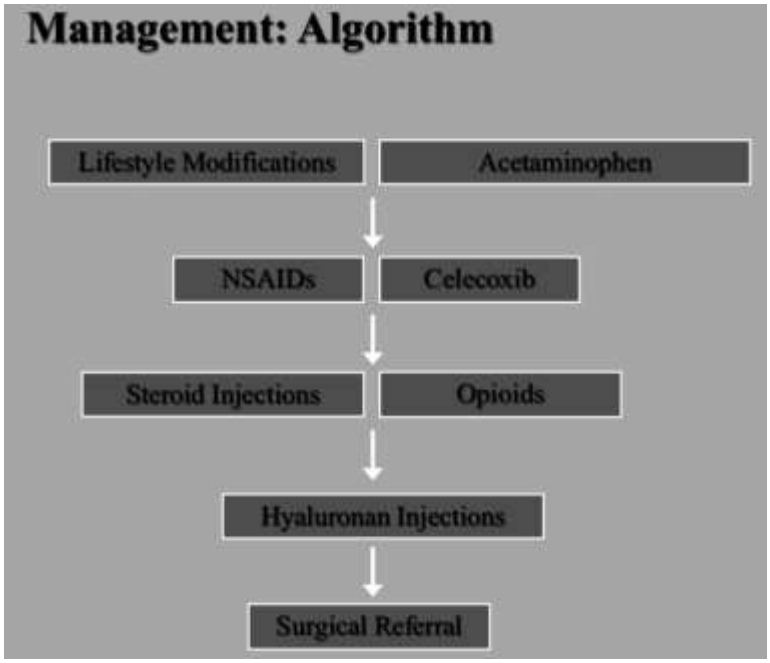


Fig 10:- Mangement algorithm.

Knee osteoarthritis (OA) is a chronic degenerative joint disease that affects millions of people worldwide. It can cause significant pain and limitations in mobility, which can have a negative impact on emotional wellbeing. The use of self-reported measures such as the visual analog scale (VAS) and Positive and Negative Affect Schedule (PANAS) can help to assess the relationship between knee OA and emotional severity.The VAS is a simple, reliable and widely used tool for measuring pain intensity in knee OA[5]. Studies have shown that patients with knee OA report significantly higher VAS scores than individuals without the disease[6]. Additionally, studies have found that higher VAS scores are associated with greater levels of anxiety and depression in patients with knee OA[7]. One study published in the Journal of Clinical Rheumatology found that patients with knee OA who reported higher levels of pain on the VAS also reported greater levels of negative affect, such as anxiety and depression[8].

The PANAS is a self-report scale that assesses both positive and negative affect[9]. In a study published in the Journal of Pain Research, researchers found that patients with knee OA had higher scores on the negative affect subscale of the PANAS than a control group without knee OA[10]. The study also found that higher negative affect scores were associated with higher levels of pain, anxiety and depression in patients with knee OA.The relationship between emotional severity and knee OA is complex, and a number of potential mechanisms have been proposed. One theory is that emotional stress can lead to increased inflammation in the body, which may exacerbate knee OA symptoms[11]. Additionally, depression and anxiety can lead to reduced physical activity, which can worsen knee OA symptoms over time[12]. Furthermore, pain and limited mobility associated with knee OA can contribute to negative affect, which can lead to a vicious cycle of worsening symptoms and emotional distress[13]. Some studies have also suggested a possible association between knee OA and cardiovascular disease[14].In addition, several performance-based tests have been recommended by the Osteoarthritis Research Society International (OARSI) to assess physical function in individuals with hip or knee OA[15].Furthermore, it is important to consider the impact of knee OA on an individual's social role participation and quality of life, particularly in middle-aged individuals[16].

Conclusion:-

In conclusion, knee OA is associated with higher levels of pain and negative affect, as measured by the VAS and PANAS scales. Emotional distress is a common feature in patients with knee OA and can have significant impact on their quality of life. Addressing emotional factors such as stress, anxiety and depression may be an important part of managing knee OA and improving patient outcomes.It can be inferred that positive emotions inhibit pain & vice versa. Women with higher centrally-mediated symptoms have greater pain severity and individuals seeking medical help for painful symptomatic osteoarthritis may be related to psychological factors. NO association was found between emotional status and radiographic severity of knee osteoarthritis using Kellgren Lawrence grade. Therefore,

a multidisciplinary approach consisting of psychologists and psychiatric counselling can prove effective in relieving the pain in osteoarthritis knees at early stages and help in preserving the God gifted natural knee to some extent.

Conflict of interests-
Nil.

Disclosures-
Nil.

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