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The Impact of Psychological Factors in Subjects with Knee Osteoarthritis Pain - A Cross Sectional Study

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KEYWORDS

Knee osteoarthritis , Depression ,Anxiety, Stress Scale ,Numerical Pain Rating Scale

ABSTRACT:

BACKGROUND AND AIM OF THE STUDY: Knee osteoarthritis (OA) stands as the leading source of knee discomfort, posing a persistent joint condition that places a significant burden on healthcare systems. It is characterised by chronic joint pain, stiffness, and mobility deficit, and it disproportionately affects older persons and women. After age 40, women have a higher risk than men of developing OA, although both sexes have a sharp increase in incidence as they become older. The most important psychological component to consider when dealing with pain. Depression, Anxiety and stress are the most psychological factors that affect the patients due to pain. This study aims to explore the influence of mental health on pain perception in individuals suffering from knee osteoarthritis. METHODOLOGY; After signing the informed permission form, 100 respondents were randomly chosen using inclusion and exclusion criteria. The participants in this study are 100 people who have been diagnosed with knee osteoarthritis. Participants between the ages of 40 and 60 were chosen from both genders. Participants are requested to complete a questionnaire that contains Depression, Anxiety, Stress, and a Numerical Pain Rating Scale as outcome measures. RESULTS: The statistical study revealed that among 100 patients aged 40-60 year found that the psychological factors are statistical significant in the female patients with knee osteoarthritis pain especially in depression , Anxiety ,and stress .CONCULSION ;This research aims to investigate how mental health influences the pain experience in individuals suffering from knee osteoarthritis. The patients scored highly on psychological aspects, including Depression, Anxiety, and Stress. The majority of the female patients, suffered from severe discomfort.

INTRODUCTION

Employee While osteoarthritis has traditionally been assessed from a biomechanical standpoint, emerging research indicates that psychological factors play a crucial role in pain management for individuals (1,2).When it comes to knee pain, osteoarthritis (OA) is by far the most frequent cause (3). Osteoarthritis (OA) is a persistent joint disease that imposes a burden on healthcare resources. Women are at a greater risk than males for OA after age 40, and the incidence rate increases dramatically beyond that point. Age, sex, weight, genetics, bone density, smoking, the environment, and joint location are all key contributors to the development of osteoarthritis, even if the condition's exact origin is still unclear. Obesity, trauma to the nervous system, central and peripheral pain pathways, social, cultural, demographic, and behavioural elements, and structural damage all seem to contribute to the pain and functional impairment symptoms experienced by people with osteoarthritis (4). If the causes of these pain flare-ups could be identified and mitigated, then the occurrence of these episodes would likely reduce or cease altogether. It has been shown that taking into account one's mental state is crucial while trying to comprehend OA discomfort (7,8). Pain from

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OA often begins as activity-related discomfort and progresses to constant pain with unpredictable flare-ups of severe discomfort. Those involved try to keep their involvement low so as not to spark off any of these outbreaks. The effect of constant torment on personal satisfaction is much less than that of intermittent pain, which may be more debilitating since it is both more intense and less consistent. The discomfort made it difficult to relax, go out with friends, and get a good night's rest. Similar results were found in a second trial including people who had quite recently been related to knee OA yet had not yet gotten a determination (prediagnostic knee OA). (9).

Chronic problems may have their roots in the emotional and behavioural responses to pain. As with "intermittent" and "continuous," the severity of everyday discomfort fluctuates considerably.Women and the elderly are more likely to develop OA, and its symptoms include persistent joint pain, stiffness, and activity restrictions. This growth in OA prevalence may be attributed to many factors, including shifting population composition, rising obesity rates, and declining rates of physical activity. (10-12)

It's important to understand the many factors that might contribute to depression. Significant gamble factors for despondency in the OA population fall into two categories: those that are universal and those that are specific to the illness itself. Studies conducted in the past were mostly cross-sectional and aimed to determine how common Major Depressive Disorder is among people with OA. (13). In this research, we looked at how oa affects symptoms of depression, stress, and anxiety.

Elderly people are also very susceptible to depression (16% prevalence). Women who have knee pain are bound to experience the ill effects of nervousness, and poor psychological mental health in OA patients has been related to disability.Conversely, depression is defined as a state of mind that is always sad or down. (15).

Patients suffering from depression were less likely to take their prescribed pain medication as directed. A pain-depression is a real issue that must be understood and taken seriously.(16).It's not clear how much of a role psychological factors play in how people describe their discomfort. The patient's perception of their coping abilities may be altered by sadness or anxiety, leading them to resort to unhealthy coping mechanisms (17).

Anxiety may have a role in perpetuating the cycle of pain and reduced mobility by making people less likely to engage in activities that would make them feel better (18).Presence of dread or concern about what could happen" is the definition of anxiety. Anxiety may be linked to the anticipation (future tense) of a terrifying event rather of a well-defined threatening stimulus when the danger is vague and not easily identifiable. Anxious people may exhibit hypervigilance, in which they constantly monitor their environment for potential threats (19).

People with knee osteoarthritis often experience depression and anxiety due to the pain and lack of mobility associated with the condition. The physical, social, and mental well-being of a patient are all impacted by the presence of depression and anxiety as co-occurring illnesses. (20,21). Few studies have looked at whether or whether physical pain may have a role in the development of depressive symptoms. Sadness caused by osteoarthritis of the knee may make pain seem worse and limit physical activity. (22,23).

Examination into constant torment uncovers that pressure might play a part in important component determining the adaption, however this has not been completely examined for all types of pain problems. Copying may be more difficult while coping with added stress if you have continuous, unexpected, and poorly understood chronic pain. It's plausible that this heightened vulnerability to psychological stimuli, including interpersonal stress, exists (24). Most of the time, the resistance of articular tissues to mechanical stress is in line with the person's state of mind. This balance may be disrupted by a variety of events, including metabolic reasons that weaken the articular tissues or mechanical disruptions that cause excessively high mechanical stress in otherwise healthy tissues. Tissue reaction to a change in emotional homeostasis (25), the cause of osteoarthritis. Reducinglocalised stress on a joint, which may help prevent the onset of post-traumatic osteoarthritis, is thought to have positive effects on joint stability, alignment, and congruity. Still, little is known about articular cartilage's regenerative abilities in the face of both acute and chronic stress in vivo (26,27). The purpose of this research is to determine

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how different psychological variables affect those who have knee osteoarthritis pain.

MATERIALS AND METHODS

SUBJECTS: Cross Sectional Study. **STUDY SETTING :** Sample are collected from Saveetha College of Physiotherapy students, SMCH, SIMATS Thandalam, Chennai – 602 105 according to inclusion and exclusion criteria. **SAMPLING TECHNIQUE:** Convenient Sampling Method was used **. SAMPLE SIZE:** 100 participants were taken for the study**. NULL HYPOTHESIS :** There is no relation between the psychological factors and pain knee osteoarthritis. **INCLUSION CRITERIA:** Patients diagnosed with knee osteoarthritis between the ages of 40 and 60, both sexes combined, are included in this study**. EXCLUSION CRITERIA:** Patients enrolled in the study who suffered from rheumatologic diseases or a related joint medical problem. Subjects who have undergone knee surgery were studiedq. The study population who had Bony tumours around the knee complex were excluded from study. **TOOLS USED:** Numerical pain rating scale (NPRS), Depression, Anxiety, Stress scale 21 (DASS21). **PROCEDURE:** A sum of 100 OA patients met the incorporation and rejection measures, therefore the research could proceed. Participants in the LEAP research were seen by their primary care physicians and given a clinical diagnosis of knee OA. Information on the participants' mental health, OA pain, and other factors was gathered via up to four interviews spaced around one week apart over the course of four weeks. Respondents willingly provide their consent to furnish demographic information, which includes their Name, Age, Occupation, Marital Status, and Residential Address, in order to obtain clinical data. As soon as we get an informed consent form, we may begin making surveys and sending them out to participants via email or hard copies. **PAIN ASSESSMENT:** Pain was evaluated using a 0-10 scale based on the NPRS subscale score. If you can envision the worst kind of suffering, it fits on this scale. I need you to put your discomfort on a scale from 0 (no pain) to 10 (extreme agony). (the worst kind of pain one can imagine). From the initial and follow-up assessments, we determined the median NPRS score for each patient each week. **DEPRESSION, ANXIETY, STRESS ASSESSMENT;** There are three different self-report scores that make up the Depression, Anxiety, and Stress Scale - 21 Items (DASS-21). Difficulty relaxing, tension, impatience, irritability, and restlessness make up the stress subscale, while physiological hyperstimulation and a subjective feeling of worry make up the anxiety subscale. The depressive subscale is characterised by a lack of hope, excessive self-criticism, a lack of positive affect, and a general decrease in the value placed on one's life.**STATISTICAL ANALYSIS :** When all of the information has been collected, it will be analysed using statistical methods and the concept of continuous variation. The average and median values will be used for all of the variables. Depressive symptoms, anxiety, and stress are all measured using the numerical pain rating scale in a statistical analysis of the patient with knee osteoarthritis pain.

2.1. Paper Title:

The purpose of this study was to assess the role of mental variables in people experiencing knee osteoarthritis pain.

2.2. Authorship:

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2.3. Abstract& Keywords

BACKGROUND AND AIM OF THE STUDY : Knee Osteoarthritis (OA), a chronic joint condition that imposes a considerable health-care burden, is the most common cause of knee discomfort. It is characterised by chronic joint pain, stiffness, and mobility deficit , and it disproportionately affects older persons and women. Women are more likely than males to develop OA after the age of 40, yet the predominance rises significantly with age. The most important psychological component to consider when dealing with pain. Depression, Anxiety and stress are the most psychological factors that affect the patients due to pain. This research aims to ascertain the influence of mental factors on the pain perception in individuals with knee osteoarthritis.

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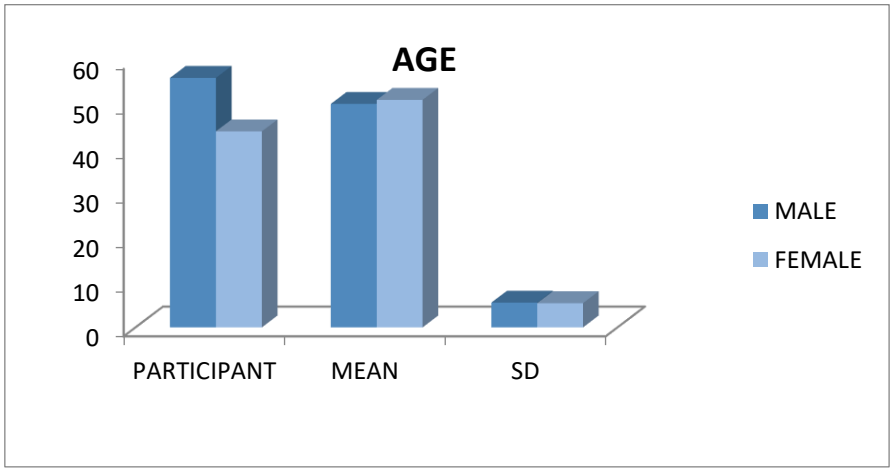
METHODOLOGY; After signing the informed permission form, 100 respondents were randomly chosen using inclusion and exclusion criteria. The participants in this study are 100 people who have been diagnosed with knee osteoarthritis. Participants between the ages of 40 and 60 were chosen from both genders. Participants are requested to complete a questionnaire that contains Depression, Anxiety, Stress, and a Numerical Pain Rating Scale as outcome measures. **RESULTS** The prevalence of physiological factors is a common issue among knee osteoarthritis pain patients in the age range of 40-60 years, based on statistical research including 100 individuals with the condition. Evaluations of the individuals' psychological characteristics are displayed in **Table 1 and Figure 1**. In conclusion, women (50%) and men (56%) had almost equal ages, with mean and standard deviations of 51.0681 ±5.437 and 50.1607 ± 5.559, respectively. Both the DASS-21 ($p \leq 0.0001$) and the pain scale ($p < 0.001$) showed higher scores for the patients in the female group. As can be shown in **Tables 2 and 3**, the male group did not experience a statistically significant reduction in their DASS-21 score (p = 0.009).). It is found that the psychological factors are statistically significant in the female patients with knee osteoarthritis pain especially in depression , Anxiety ,and stress.**CONCULSION ;**This study aims to investigate how mental well-being influences individuals' capacity to manage pain associated with knee osteoarthritis.The patients scored highly on psychological aspects, including Depression, Anxiety, and Stress. The majority of the female patients, suffered from severe discomfort. **KEY POINTS** :Osteoarthritis of the knee, the Beck Depression, Anxiety, and Stress Scale, and the Numeric Pain Rating Scale.

2.4. Figures :

FIGURES 1 : TABULATED DIFFERENCE BETWEEN MALE AND FEMALE

The provided figure shows 100 participants with knee osteoarthritis pain, corrected for mean, SD, sex, and age.Qualities of the Exchange Participants The results of the psychological tests are shown in the figure below.



The given figure leads me to the conclusion that, with respect to standard deviation , mean and age, half of the population is male and the other half is female.

2.5. Tables :

Our research of 100 people with knee osteoarthritis pain found that those between the ages of 40 and 60 worry more about the frequency of psychological factors.Characteristics of the Participants Below is a table containing the results of the psychological testing.

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TABLE 1: A COMPARISON OF MALE AND FEMALE CHARTS

GENDER	TOTAL NO OF PARTICIPANTS (N=100)	AGE MEAN ± SD
MALE	56	50.1607± 5.559
FEMALE	50	51.0681 ±5.437

TABLE 1. In conclusion, males make up half of the population with a standard deviation of 50.1607 5.559, while women make up the other half with a variance of 51.0681 5.437.

Table 2 : Demonstrates the average pain and DASS21 scores for male and female across a range of conventional severity levels.

CHARACTERISTICS	NORMAL (S_1)	MILD (S_2)	MODERATE (S_3)	SEVERE (S_4)	EXTREMELY SEVERE (S_5)
DEPRESSION					
MALEGROUP	3.6 ± 2.366	11.4±1.1737	16.4±2.065	23.4±2.065	29.9± 1.791
FEMALE GROUP	4.5± 3.027	11.9±0.994	18.30±2.002	26.3±2.213	33.9± 2.726
PVALUE	0.4684	0.3176	0.0512	0.0072	0.0011
ANXIETY					
MALEGROUP	5.1± 2.330	10.1± 0.516	14.2±1.1619	16.1±1.370	22.9± 2.078
FEMALE GROUP	3.1± 2514	8.7± 0.516	11.3±1.159	19.1±1.286	26.9± 2.558
PVALUE	0.0815	0.0001	0.0002	0.0001	0.0012
STRESS					
MALE GROUP	6.1±4.433	16.2± 1.032	20.9±2.139	27.9±2.282	35.2± 1.398
FEMALE GROUP	9.0± 4.082	18.4± 1.173	21.4±2.170	29.8±2.616	39.5± 1.433
P VALUE	0.14	0.0003	0.61	0.10	0.0001
NPRSPAIN					
MALE GROUP	0.80±0.42	1.60± 0.70	4.70±0.82	7.30±0.48	9.20±0.42
FEMALE GROUP	0.50±0.53	3.10±0.88	7.20±0.79	9.60±0.52	10.60± 0.52
P VALUE	0.1	0.0005	0.0001	0.0001	0.0002

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Table 3: illustrates the variations in baseline DASS 21 scores and mean pain between men and women.

OUTCOME MEASURES	MALE GROUP				FEMALE GROUP			
	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE
	S_1 VS S_2	S_1 VS S_3	S_1 VS S_4	S_1 VS S_5	S_1 VS S_2	S_1 VS S_3	S_1 VS S_4	S_1 VS S_5
NPRS	0.55	0.009	<0.001	<0.001	<0.001	0.001	0.001	0.001
DEPRESSION	0.001	0.001	0.001	0.001	<0.001	0.001	<0.001	0.001
ANXIETY	0.001	<0.001	0.001	0.001	<0.001	0.001	<0.001	0.001
STRESS	0.001	0.001	0.001	0.001	<0.001	0.001	0.001	0.001

TABLE 2 and 3

Out of a total of 100 patients, we find that 44.93% had depressive symptoms, 27.53% had anxious ones, and 27.54% were stressed.Patients with depression are further categorised into four groups depending on severity: those with mild depression (40.3%), moderate depression (49.9%), severe depression (3.9%), and extreme depression (5.7%).Anxiety patients (Mild Anxiety -48.9%,Moderate Anxiety -42.5%,Severe Anxiety -4.3 %,Extreme Anxiety -4.3%) and like wiseStress patients (Mild stress-48.7%, Moderate stress -44.3%,severe stress -3.0%,extreme stress -4.0%) NPRS (Mild -10.85%,Moderate – 12.85%, servere -32.9%,extreme severe -43.4 %).

In women, the link between mental health and physical discomfort is statistically stronger than in men. It was shown that, among the psychological factors studied (depression, stress, and anxiety), only depression had a statistically significant association with pain reduction.

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RESULTS

The prevalence of physiological factors is a common issue among knee osteoarthritis pain patients in the age range of 40-60 years, based on statistical research including 100 individuals with the condition. Evaluations of the individuals' psychological characteristics are displayed in **Table 1 and Figure 1**. In conclusion, women (50%) and men (56%) had almost equal ages, with mean and standard deviations of 51.0681 ±5.437 and 50.1607 ± 5.559, respectively. Both the DASS-21 ($p \leq 0.0001$) and the pain scale ($p < 0.001$) showed higher scores for the patients in the female group. As can be shown in **Tables 2 and 3**, the male group did not experience a statistically significant reduction in their DASS-21 score ($p = 0.009$).). It is found that the psychological factors are statistically significant in the female patients with knee osteoarthritis pain especially in depression , Anxiety ,and stress.

DISCUSSION

In our study, we looked at the prevalence of depression, anxiety, and stress, as well as the relationship between demographics, functional restrictions during daily activities, and pain in osteoarthritis knees, which can lead to a variety of mental and physical problems. Our findings revealed that the prevalence of depression symptoms was 44.93% in patients with knee osteoarthritis, yet the commonness of tension and stress symptoms (approximately 39.2%) was significantly lower than the prevalence of depression symptoms. A similar cross-sectional study found a prevalence of depression (approximately 50%), anxiety, and stress (approximately 33.5%) in knee osteoarthritis patients, as well as Increased knee pain and functional limitation[28].

Loss of interest in previously enjoyed pursuits, memory difficulties, and a preference for staying in rather than venturing out are all risk factors for developing depression. The elderly and sickly nature of the individuals may help to explain these findings. Elevated degrees of fiery disease might consolidate with melancholy to prompt memory issues in the aged(29). Memory decline was more prevalent in the elderly, and this was followed by a higher incidence of depression.In the current examination, a comparable example arose, wherein the degree of wretchedness was viewed as higher in the patients who commonly affect the locomotor restriction and stiffness, which may reduce the communication and deepen the loneliness and uselessness, which may lead to depression.

Correlational analyses were conducted to assess the effectiveness of the method in relation to the following variables: pain, functional limitations in daily activities and sports participation, feelings of depression, anxiety, and stress, pain catastrophizing, and pain self-confidence. Foo CN et al. (2020) found that this method dramatically decreased knee pain, enhanced patients' capacity to complete daily tasks, improved their response to pain catastrophizing (30), and reduced patients' sadness and anxiety. Our present research found that individuals with OA of the knee who faced with sadness, worry, and stress had a far better response to pain than those who did not, and that higher disability was connected with loss of movement skill and leg muscle strength. These psychological morbidities are quite common in osteoarthritis patients, despite the fact that depressed side effects are a more precise indication of disability than radiological proof of degenerative joint irregularities.

Osteoarthritis may likewise adversely affect an individual's psychological wellness by setting off sensations of despondency, stress,and tension. KARP JF et al (2019) concluded that the Osteoarthritis also has an impact on a person's mental well-being, manifesting as depression, anxiety, and stress. In the current investigation we noticed that the mental disease is marked by on-going sadness and lack of interest. It has an effect on one's state of mind, thoughts, and actions, and may lead to a variety of health issues. As a result, resolving the issues associated with osteoarthritis may help patients regain psychological fitness, which improves their social health indirectly enhances their social health. [31] ,Later ROSS WILKIE et al (2012).·Having depressive symptoms may make it difficult, if not impossible, to take part in everyday activities like going out with friends or going to the gym (32). According to the study's discussion, the majority of patients suffering from knee osteoarthritis experienced severe pain as a result of psychological problems.

CONCLUSION

The preceding research leads us to the conclusion that people's mental health has a role in their experience of

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knee osteoarthritis pain. Patients suffering from knee osteoarthritis reported high levels of pain. Considering the psychological aspects of both male and female patients, we find that female patients are more vulnerable than male patients.

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