

The association among perception of osteoarthritis with adverse pain anxiety, symptoms of depression, positive and negative affects in patients with knee osteoarthritis: A cross sectional study

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Abstract

Objective: To examine the association of perception of osteoarthritis with adverse pain anxiety, symptoms of depression, positive and negative affects in patients with knee osteoarthritis, and to identify the prevalence of these parameters in male and female patients.

Methods: The cross-sectional study was conducted at the Department of Orthopaedic Surgery, Pakistan Institute of Medical Sciences, Islamabad, Pakistan, from September 2017 to December 2018, and comprised osteoarthritis patients, aged 30-60 years. Psychiatric evaluation consisted of a semi-structured interview based on the Present Status Examination, and assessment was done using Beck Depression Inventory, Positive and Negative Affect Scale, Osteoarthritis Scale, and the Pain Anxiety Scale. Radiographic examination was done to evaluate knee osteoarthritis. Data was analysed using SPSS 20.

Results: Of the 250 subjects 144(57.6%) were males and 106(42.4%) were females. The overall mean age was 55.09+/-10.60 years. The patients had a strong inclination to enhance psychiatric illnesses ($p < 0.05$), and gender differences were significant in this regard ($p < 0.05$).

Conclusion: Osteoarthritis patients revealed high prevalence of pain anxiety, depression and mood swings. Male patients were predisposed more towards psychiatric features compared to females.

Keywords: Knee osteoarthritis, Psychiatric features, Depression, Pain, Anxiety, Mood disorder, Cross-sectional study. (JPMA 71: 645; 2021) DOI: <https://doi.org/10.47391/JPMA.862>

Introduction

Osteoarthritis (OA) is a persistently evolving joint illness which generally influences the older population.^{1,2} Symptomatic OA happens in 13% of elderly women as well as 10% of older men.³ OA is one of most crucial arthritis types as well as the leading reason of progressive chronic diseases.¹ Roughly one out of five OA patients face depressed mood.⁴ Because of enhancement in life anticipation, sedentary lifestyle, obesity as well as geriatric population, OA is the most important emerging health issue globally.^{5,6} Nonetheless, there is heterogeneity in the severity, clinical presentation and trajectory of OA symptoms globally.^{7,8} Numerous studies have recognised various OA patient forms, such as depressive symptom phenotype that identified with a distinctive group of symptomology.^{9,10} OA development could occur faster in subtypes with depressive signs as well as other psychosocial problems.^{6,7} Depression signs present in 20% of OA patients still are under debate regarding patients getting mental healthcare services.^{11,12} Deleterious factors, like depression, anxiety and mood disorders, are considered

dangerous obstacles to therapeutic management and it may contribute to OA severity.¹³⁻¹⁵ A study found that depression signs were linked with enhancement in musculoskeletal pain. However, it has a reciprocal association with depression and its symptomology.¹⁶ Specially, it enhances OA pain and its severity that could contribute to the growth and exacerbation of depression signs, while the occurrence of depression signs may aggravate the feeling of OA pain.¹⁶ Moreover, OA patients who have depression symptoms are also found with additional functional restrictions or higher level of pain severity that leads to the onset of other psychological problems, such as positive or negative mood and worse physical performance.¹⁷ In addition, current investigation reveals that OA pain severity enhances with determination of depression signs, and it has been suggested that this could indirectly lead toward more functional impairment.¹⁴ Moreover, depression disorder will account for the maximum disability level agreement to any mental disorder or physical globally in 2030.¹⁸ There is debate among scholars that OA is the most important leading factor for the development of physiological disorders, including depression, pain anxiety, mood disorder, all over the world.¹⁹ Mental health issues, such as depression, anxiety and mood disorders, affect young adults as well as elderly people.¹⁰ Approximately 10% of the old population

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experiences severe depressive and anxiety disorder.²⁰ Depression is well recognised to be a noteworthy contributor to enhanced health and psychological problems and is the most important reason of different diseases, as it also causes non-fatal health problems.^{21,22} Numerous studies reported that depressive signs were associated with cerebellar degenerative and OA diseases.²³⁻²⁵ It is imperative to determine the incidence and prevalence of psychiatric feature in this elevated risk person. Conversely, the succession of symptomatic proceedings after depression onset and their effects on pain level or physical function in OA patients are under debate. Studies have centred on the earlier causal pathway apart from the latter.²⁵⁻²⁸

Moreover, knee osteoarthritis (KOA) is considered one of most important reasons of disability²⁹ in old people across the world³⁰ and is considered in the top 10 diseases of disability globally.^{31,32} The occurrence of symptomatic KOA in older people aged 55-64 years is reported at 12-16%.³³ There are several psychological and biological mechanisms during which the disability and pain of KOA may contribute to mood disorder, anxiety and depression. Chronic pain shrivels brain region detailed for emotion regulation and mood management.³⁴ It is also responsible for managing mood homeostasis in reaction to stress stimulus,^{7,35} and impairment in this region may be responsible for isolation, demoralisation and decreased self-efficacy to tackle life stressors in KOA patients.³⁶ It is reported that depression symptoms were 2-3 times more in KOA patients.^{37,38} and KOA patients with co-morbid symptoms of depression are most in danger.

Worldwide disability as a result of mental problems in 2017 ranked mental problems, including major depressive disorder, at the 5th position and declared it a leading cause.³⁹ On the other hand, anxiety disorders were also ranked at the 10th position.³⁹ The World Health Organisation (WHO) describes mental health as a 'condition of wellbeing in which each person comprehends her or his own potential that can help to cope with the daily life's stresses, it could work fruitfully or productively as well as is able to provide an input to his or her society'.⁴⁰ Therefore, better mental health is a mixture of social, emotional and psychological well-being that entails coping skills, good social skills and positive mood.⁴¹ The presence of these factors shows mental health strength compared to the absence of psychological problems.^{42,43} Patients with better mental health experience less chronic physical diseases compared to patients with poorer mental health and history of major depression episodes and mood disorder.⁴⁴

However, mood is referred to as emotions, feelings or

affects of person. In other words, moods are usually defined as having either a negative or positive disposition.¹ Positive mood/affect can be sourced by several factors of life and have positive effects on humans simultaneously. Good/positive affect is commonly believed to be a condition without a recognised reason; individuals cannot identify precisely why they are in a good mood. People look to understand a positive affect once they have had a good night sleep and living without stress and fear in their life. There have been studies on the effect of positive feeling, emotion and affect on the intellectual ability as well as there is assumption that positive affect can influence our minds and daily functioning in bad or good ways. Commonly, positive affect has also been pinpointed to increase creative problem-solving.⁴⁵ Studies have revealed that positive affects let individuals think freely, imaginatively and more creatively. Positive mood can further help persons in circumstances in which brainstorming and heavy thinking is required. Positive affect also supports confrontation to temptations, particularly related to health.⁴⁶ Similar to positive moods, bad/negative moods have significant inferences for human physical and mental wellbeing. Moods/affects are essential psychological conditions that may happen as a result of stressful stimulus or may surface for no obvious external reason. While there is no deliberate factor that reasons the negative or vulnerable mood, there is no fixed start or end date. It can occur for short and longer periods of time. Negative affects describe how persons understand, interpret and explain the world and can further control their behaviours. Negative affect can influence a person's perception of events and objects.⁴⁶ A study showed that individuals are tuned to perceive things that are congruent with their current mood. Negative moods, mostly low-intense, can control how humans perceive emotion-congruent objects and events. Negative moods have also been associated with poor self-esteem, aggression, anxiety, depression, physiological stress, health problems and decreased sexual urge.⁴⁷

The current study was planned to examine the association of perception of OA with adverse pain anxiety, symptoms of depression, positive and negative affects, and to identify the prevalence of these parameters in male and female KOA patients.

Subjects and Methods

The cross-sectional study was conducted at the Department of Orthopaedic Surgery, Pakistan Institute of Medical Sciences, Islamabad, Pakistan, from September 2017 to December 2018. After approval from the ethics review committee of the Rawalpindi Campus of Foundation University, Islamabad, and the institutional authorities, the sample size was estimated using the WHO

sample size calculator with alpha 5% and 0.05 precision.^{47,48} The sample was raised using non-probability purposive sampling technique. Those KOA patients with age ranged from 30 to 60 years were included in the current study. Patients with a past history of knee surgery, peri-articular fracture, neurological problems, and inflammatory arthritis were excluded from the present study.

IKOA was diagnosed using radiographical KOA Kellgren/Lawrence grade ≥ 12 .

After getting written informed consent from participants, comprehensive past history was taken. Psychiatric assessment was done using Beck Depression Inventory (BDI), Positive and Negative Affect Scale (PANAS), Knee Injury and Osteoarthritis Outcome Score (KOOS), and Pain Anxiety Symptoms Scale (PASS). Knee Osteoarthritis Scale (KOS) and 5-repetition chair position test were used to evaluate perception of OA.⁴⁹

BDI, PANAS, OS and PASS were used for screening psychiatric disorders, such as depression, pain anxiety and mood swings. Subsequently, diagnostic interview was conducted to confirm the appropriate diagnosis in line with the Diagnostic and Statistical Manual of Mental Disorders Fifth edition (DSM-5) criteria.⁵⁰ Questions related to duration, onset, and severity of the condition, and were answered with 'not at all', 'moderately', 'very much', and 'rarely' options. KOOSI was used to measure long- and short-term patient-relevant outcomes subsequent to knee injury. It consists of five outcomes: activities of daily living (17 items), pain (9 items), sport and recreation function (5 items), symptoms (7 items) and knee-related quality of life (QOL) (4 items). It is also designed to examine the course of treatment outcome and knee injury. It has adequate reliability and validity with Cronbach alpha coefficient of subscales being knee-related QOL 0.24, pain 0.47, activities

of daily living 0.73, symptoms 0.38 and function in sport and recreation 0.70.⁵¹

PASS was used to examine fear and anxiety-related responses specific to pain. It comprises of 20 items and 4 subscales: fear (4 items), cognitive (6 items) physiological anxiety (5 items) and escape avoidance (5 items). Cronbach alpha coefficient of subscales are 0.67 for fear, 0.64 for cognitive, 0.68 for physiological avoidance and 0.56 for escape avoidance.⁵²

BDI was used to evaluate attitudes and symptoms of depression. It is a 21-item self-report rating inventory.⁵³ It is used to diagnose depression and to evaluate level of depression, with 0-13 score indicating normality, 14-19 mild depression, 20-28 moderate depression, and 29-63 indicating severe depression.⁵⁴

PANAS was used to measure positive and negative affects in OA patients. It is a 20-item scale which consists of positive and negative subscales with 10 items each which is scored on a five-point Likert tool from 1 = Very slightly or not at all to 5 = extremely. Alpha coefficient subscale of positive affect is 0.65 and that of subscale of negative affect is 0.67.⁵⁵

Data was analysed using SPSS20. Frequencies and percentages for gender and occurrence of psychiatric features were calculated. Mean and standard deviation (SD) for gender differences were computed on depression, pain anxiety, OA, positive and negative affects. Independent sample t-test was used to compare the mean differences on study variables. Correlation analysis was performed to analyse the relation between perception of OA and psychiatric features.

Results

Of the 250 subjects 144(57.6%) were males and 106(42.4%) were females. The overall mean age was

Table-1: Descriptive statistics as mean (M), standard deviation (SD), skewness (S) and kurtosis (K) of depression, pain anxiety, perception of osteoarthritis, positive and negative effects and along their scales in knee osteoarthritis patients (N=250).

Variables	K	Min	Max	M	SD	K	S
Pain anxiety	250	13.00	91.00	66.32	15.79765	-1.008	.593
Cognitive	250	6.00	45.00	19.82	5.74662	-.196	1.243
Fear	250	3.00	20.00	13.82	3.96552	-.861	.026
Escape Avoidance	250	.00	43.00	16.55	5.30801	-.465	2.774
Physiological Anxiety	250	1.00	26.00	16.10	5.38274	-.564	-.197
Osteoarthritis	250	45.00	192.00	138.37	27.61714	-.701	.388
Pain	250	8.00	87.00	24.50	7.84945	.256	.488
Activities of Daily Living	250	19.00	85.00	55.64	12.70417	-.439	-.109
Sport and Recreation Function	250	.00	32.00	16.32	4.64443	.049	1.091
Knee-related Quality of Life	250	.00	20.00	13.38	3.49592	-.842	1.100
Depression	250	1.00	4.00	3.85	.56261	-4.119	1.415

Table-2: Mean (M) and standard deviation (SD), correlation matrix and alpha (α) coefficient among depression, pain anxiety, perception of knee osteoarthritis, positive and negative effects in knee osteoarthritis patients (N= 250).

Variable	M	SD	α	1	2	3	4	5
1. Pain anxiety	66.32	15.79	.84	-	.01	.16*	.14*	.28**
2. Osteoarthritis	138.37	27.61	.83		-	.35**	-.11	-.02
3. Depression	39.50	9.39	.73			-	.04	.16*
4. Positive affect	17.47	3.43	.65				-	.46**
5. Negative affect	16.38	2.98	.67					-

Table-3: Mean (M) differences on depression, pain anxiety, perception of osteoarthritis, positive and negative effects in male and female osteoarthritis patients (N=250).

Variables	Male osteoarthritis Patients (n=144)		Female osteoarthritis Patients (n=106)		t(df)	P	95%CI		cohen's d
	M	SD	M	SD			LL	UL	
PA	68.84	14.67	62.85	16.67	3.0(206.69)	.00	2.06	9.92	.38
OA	138.01	27.85	138.85	27.41	-.23(226.20)	.81	-7.85	6.17	-
DEP	40.34	8.13	38.37	10.82	1.63(186.76)	.10	-.39	4.32	-
PAF	17.83	3.40	16.98	3.44	1.94(224.66)	.05	-.01	1.71	0.24
NAF	16.54	2.70	16.16	3.33	.99(197.39)	.31	-.37	1.13	-

Note: CI: Confidence interval; LL: Lower limit; UL: Upper limit; PA: Pain anxiety; OA: Perception of osteoarthritis; DEP: Depression; PAF: Positive effect; NAF: Negative affect. $p < 0.05$, $p < 0.000$.

Table-4: Depression disorder presentations with gender distribution in osteoarthritis patients (N=250).

Prevalence of Psychiatric Disorder	Gender Responses (%)			
	Male (n=144)		Female (n=106)	
Depression	Frequency	(%)	Frequency	(%)
Normal	2	1.4	4	3.8
Mild depression	4	2.8	2	1.9
Moderate depression	3	2.1	3	2.8
Severe depression	135	93.8	97	91.5
Total	144	100.0	106	100.0

55.09 $\pm$ 10.60 years. Values for pain anxiety, perception of OA, positive and negative affects were under the acceptable range (Table-1).

Pain anxiety was positively associated with depression, positive and negative affects; perception of KOA was positive linked to depression; depression was positively related to negative effects (Table-2).

Psychiatric disorders, such as depression, pain anxiety, positive and negative affects were more prevalent in male patients compared to females who showed more perception of osteoarthritis than males (Table-3). Overall, severe depression was found in 232(92.8%) of the KOA patients.

Discussion

Findings demonstrated that perception of KOA was positively associated with depression. However, KOA perception was not significantly related to pain anxiety,

and positive and negative affects ($p > 0.05$). Also, there were positive association among pain anxiety, depression, and positive and negative affects in KOA patients. The findings are consistent with literature which found that depression symptoms were associated with the development of musculoskeletal pain while having a reciprocal association with depression and its symptomology.¹⁶ OA patients who have depression symptoms are also found to have additional functional restrictions or higher level of pain severity that leads to the onset of other psychological problems, such as positive or negative mood and worse physical performance.¹⁷ The current study revealed that OA pain severity enhanced with the determination of depression signs and may subsequently lead to more functional impairment.¹⁴

The secondary objective of the current study was to determine the incidence and prevalence of psychiatric features in female and male OA patients. Findings illustrated that OA was associated with psychiatric features, such as pain anxiety, depression as well as mood swings in OA patients. Findings also demonstrated that male OA patients were more prone to development of positive affect compared to female OA patients. Severe depression was found in 135(93.8%) male patients compared to 97(91.5%) females. The results are in line with parallel studies done globally.^{56,57} Interestingly, 72.5% psychiatric morbidity, like depression, has been observed in female OA patients.^{58,59} Another study performed in six European countries confirmed that

chronic and persistent joint pain was linked to depression, mood swings and anxiety symptoms in elderly OA patients.^{60,61}

The most important limitation of the current study is that it was done at a single hospital. More KOA patients from various hospitals could have been enrolled to improve generalisability of the findings.

Conclusion

There was high prevalence of psychiatric features in KOA patients.

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Conflict of Interest: None.

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