

CORRELATION OF KNEE PAIN WITH ANXIETY AND DEPRESSION IN MIDDLE-AGED KNEE OSTEOARTHRITIS PATIENTS

Abstract

Background: Worldwide, osteoarthritis predicted to become the fourth leading root cause of disability. The chronic pain associated with the disease consequently results in a disabling state. The prevalence of mental health problems among pre-elderly age group is approaching closer to the level reported in elderly population. Hence the study aimed to determine the relationship of knee osteoarthritis associated joint pain with mental health impairments i.e. anxiety and depression in middle aged knee osteoarthritis population.

Methods: To fulfil the purpose of the prospective, observational study, a sample of hundred participants meeting the eligibility criteria were included in the study. After giving the written informed consent, the individuals were asked to autonomously report their Numeric Pain Rating Scale (NPRS) score and Hospital Anxiety and Depression Scale score to the concerned investigators.

Results and Conclusion: The mean (SD) of knee pain, anxiety and depression scores were 6.86 (1.042), 14.52 (3.450) and 14.51 (3.166) respectively. The correlation between knee pain and anxiety was 0.216 whereas the correlation between knee pain and depression was -0.036. The study revealed a weak positive correlation between knee pain and anxiety and weak negative correlation between knee pain and depression. During the management of knee osteoarthritis population, special attention should be made to address anxiety issues and the treatment of disease related joint pain should always include relaxation techniques to impart an

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effective management of the pain.

Keywords: Mental Health, Knee, Osteoarthritis, Pain, Anxiety, Depression.

I. INTRODUCTION

Worldwide, osteoarthritis predicted to become the fourth leading root cause of disability[1]. The 2020 worldwide incidence of knee osteoarthritis among forty and above years, was 654.1 million[2]. The reported Indian prevalence of knee osteoarthritis is 28.7%, however the prevalence was found higher among village residents (31.1%) and citizens belonging to big cities (33.1%) comparative to small cities (17.2%) and towns (17.1%)[3], the higher prevalence among the villagers might be associated with the living style specially toileting habits practiced by them, however sedentary lifestyle might be the reason behind higher prevalence reported in big cities.

Osteoarthritis of the knee joint is well known to have a significant impact on economic status, quality of life, morbidity and mortality of the involved individuals[4]. Osteoarthritis is regarded as the commonest chronic musculoskeletal disorder[5]. The degenerative disease is progressive in nature and encounters whole joint structure[5]. The disease associated chronic pain resulting in a disabling state, is the commonest repercussion of the disease. Among knee osteoarthritis population, pain and functional limitations were reported as the major impairments that hampers individual's quality of life[6]. Pain was reported as the main highlighted aspect for the affected individuals to adopt replacement surgery[7]. With time the symptoms of the disease tend to intensify, turn more frequent and debilitating[8].

Arthritic patients represents predisposition to higher psychiatric morbidity[9,10]. The prevalence of mental health problems among elderly Indian population aged sixty years and above was reported as 24.6%[11]. Proneness of elderly population towards the development of mental health issues might be due to loneliness, deprived familial support, facing negligence[11] etc. The prevalence of mental health problems in Indian pre-elderly population i.e. forty five to fifty nine years was reported as 22.2%[11], surprisingly the prevalence of mental health problems among pre-elderly age group is approaching closer to the level reported in elderly population, irrespective of the fact that the middle aged individuals unlike elderly ones, usually found engaged in family and loaded with familial as well as official responsibilities, hence have no such psychosocial factors that are common in elderly population.

Middle aged individuals are more tolerant than youngsters and more productive than older ones, a state of disturbed mental health at this stage of life could potentially demonstrate disastrous consequences later i.e. in elderly phase with superimposition of a number of predisposing-aggravating factors. A number of studies conducted to examine the presence of mental health impairments in elderly knee osteoarthritis population however recently none of the study was conducted specially over Indian population that dealt with middle aged individuals. Osteoarthritis of knee joint offers a number of confounding variables to research studies including aging, unemployment (retirement in elderly) and sedentary living style which were considered as some of the factors found associated with higher prevalence of the disease[3], among these factors some are found common in elderly ones and could be a potential contributor of mental health impairments, resultantly the findings obtained through elderly population, could not justify the relationship of mental health impairments with knee osteoarthritis i.e., the sole contributor of mental health impairments is osteoarthritis or a confounding psychosocial factor.

Hence the study aimed to determine the relationship of knee osteoarthritis associated joint pain with mental health impairments i.e. anxiety and depression in middle aged knee osteoarthritis population.

II. METHODOLOGY

The prospective observational study was conducted with a sample of convenience of hundred participants. The subjects for the study were selected from knee osteoarthritis population referred to rehabilitation centre and physiotherapy department of the institute's hospital. American College of Rheumatology Criteria confirmed knee osteoarthritis patients with age group of 40 to 50 years, can read and comprehend English language, were included in the study. Individual's with osteoarthritis less than Kellgren-Lawrence grade II, any systemic disease; metabolic disorder; cancer; recent physical, personal or socioeconomic trauma were all excluded. Written informed consent was collected from all the subjects before initiating the study.

Each included individual was made to sit in isolation in a calm, well-lighted, well-ventilated, disturbance free room. One of the investigator collected the participant's Numeric Pain Rating Scale (NPRS) score. NPRS is an eleven point scale rating from 0 to 10, the likert levels represent different pain intensities in increasing order from 0 to 10, hence 0 represent no pain and 10 represent worst imaginable intensity[12], for the purpose of the study the patient was asked to mark the level that best defines his or her state. An investigator other than the one collected the NPRS score, served the individual with Hospital Anxiety and Depression Scale (HADS) Questionnaire, the HADS is a fourteen item anxiety and depression subscale bearing questionnaire, each item is likert into four points i.e. 0 to 3[13] where a higher score defines severity of the assessment items. The individual is asked to read the instructions and fill-out the questionnaire accordingly. No time limit was imposed on the individual for completing the questionnaire, the investigator stayed within the room to assist the individual to avoid misunderstanding of any question, however the investigator was strictly instructed to avoid imposing any influence on individual's response. Only after individual's willing submission of questionnaire, the questionnaire was collected and none of the paper was returned to the individuals for any correction or omission.

III. RESULTS

Out of 100 eligible patients approached, all the individuals agreed to participate in the study. The demographic characteristic of the participating individuals is mentioned in table 1. The flow of the study is depicted in figure 1. The statistical analysis of the data was performed with SPSS software version 19. The mean values and correlational analysis of the studied variables is mentioned in table 2, figure 2 and table 3, figure 4 respectively.

Table 1: Demographic Details of the Study Participants

Variables	Mean	Standard Deviation
Age (years)	46.6	2.55
Body Mass Index (kg/m ²)	29.47	3.66
Gender	.60	.52

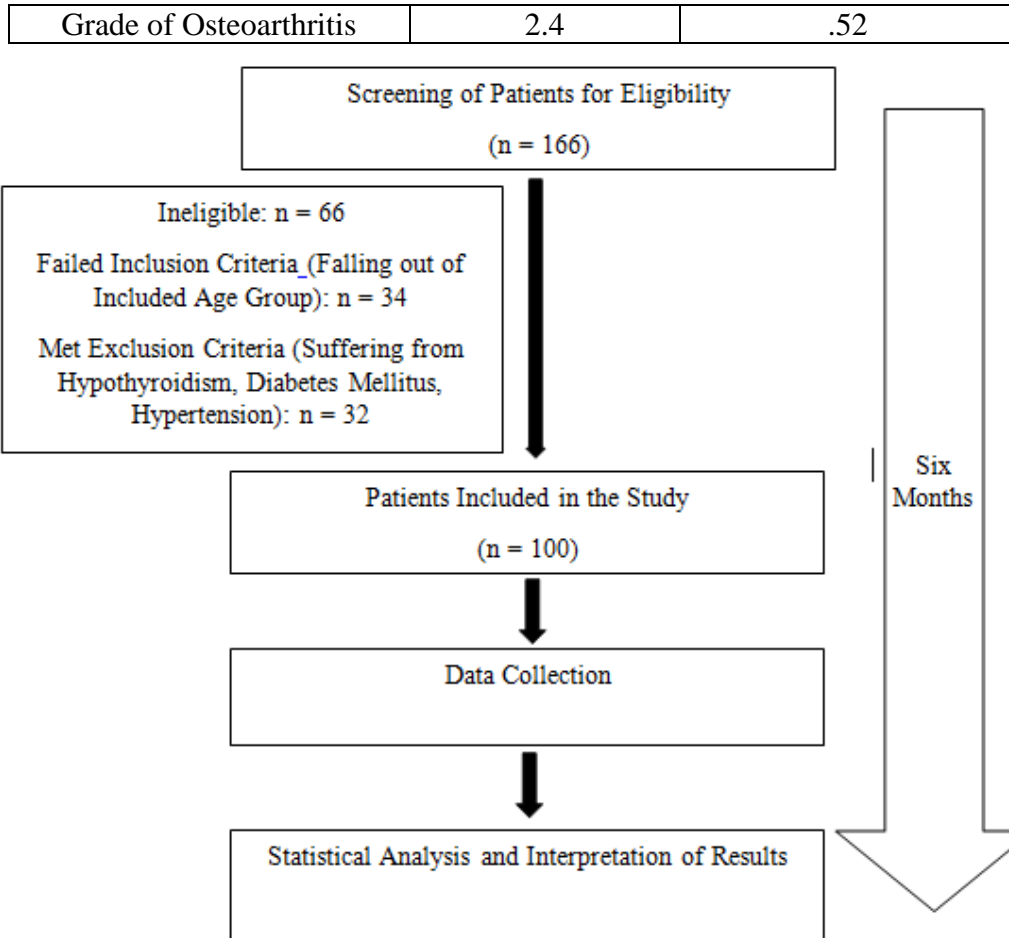


Figure 1: Flow of the study program

Table 2: Means Values of Pain (NPRS), Anxiety and Depression Scores

Variables	Mean	Standard Deviation
NPRS	6.86	1.042
Anxiety	14.52	3.450
Depression	14.51	3.166

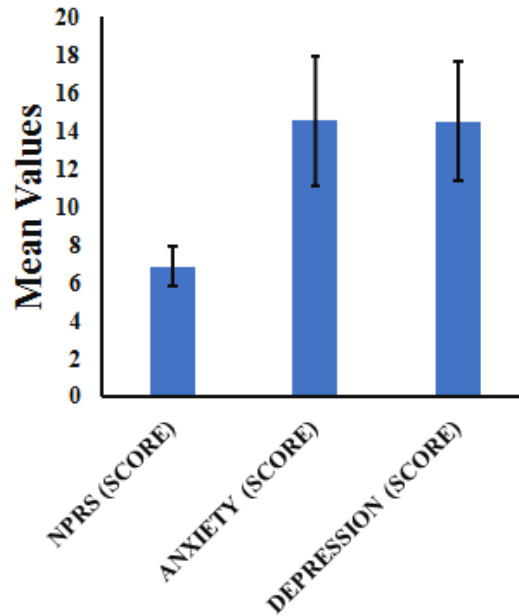


Figure 2: Graphical Representation of Mean Values of Pain, Anxiety and Depression Scores

Table 3: Correlational Relationship between Knee Pain (NPRS) With Anxiety and Depression

	Correlation Coefficient (r)	p-Value
	Knee Pain (NPRS)	
Anxiety	0.216	0.027
Depression	-0.036	0.717

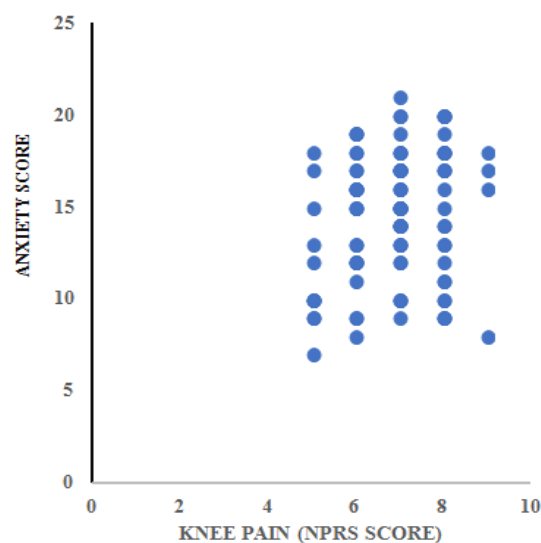


Figure 3: Correlation between Knee Pain and Anxiety

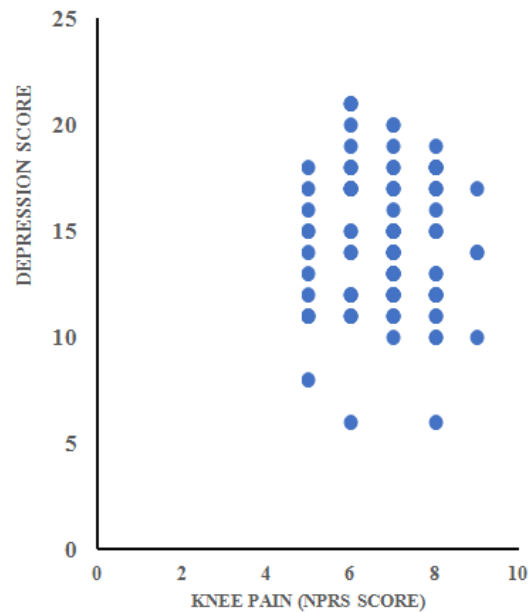


Figure 4: Correlation between Knee Pain and Depression

IV. DISCUSSION

The Observational study was conducted to study the association of knee pain with anxiety and depression in knee osteoarthritis population. The purpose of conducting the study was to attract the attention of the healthcare agencies to consider mental health impairments in the management of knee osteoarthritis. The results of the study revealed a mild positive correlation between knee pain and anxiety whereas the correlation between knee pain and depression was mild negative.

Axford J et al. 2010, supported the study results for anxiety, however for depression the conclusive findings were different, the author reported mild positive correlational relationship between knee pain Visual Analogue Scale score and HADS anxiety score, whereas the correlation between knee pain and HADS depression score was also mild positive[10]. Van Baar et al. 1998, in a cross-sectional study concluded absence of any association between depression and knee pain[14]. Creamer et al. 1999, in his cross-sectional study revealed a similar of evidencing no association between depression and knee pain[15]. Peat and Thomas 2009, reported no significant association present between knee pain and perceived anxiety[16].

The resulted correlational relationship of knee osteoarthritis associated pain with anxiety and depression favours the burdensome, deteriorating quality of life of the affected individuals, pain related limitations of individual's personal and/or social functions, progressive characteristic of the disease, dependence, absenteeism from work, economic burden for fulfilling medical attention and appointing helpers for work assistance or home making, all can potentially impose a huge burden on individual's mental health. The stress and fear of future course of the disease, compromised family or work-related responsibilities, might potentially contribute to an anxious state that found associated in the study with the most disturbing symptom i.e. pain. The studied age group unlike elderly, usually have lots

future aspirations and present duties, inability or incomplete fulfilment of the expected goals are likely to contribute anxiety rather than depression. The concerned age group represent more tolerant behaviour that favours to fulfil the desired-needed role anyhow without choosing a backseat in life, hence setting up of a hyperactive state than a hypoactive state is more likely.

The future studies with similar interest are advised to consider some study associated limitations, the sample could be of comparatively larger size, participants could be engaged from multiple hospitals situated in different zones of the city to represent better geographical distribution, the sample could be of higher homogeneity and additional outcome measure tools could be utilised to explore the disease associated mental impairments.

In conclusion, the study revealed a weak positive correlation between knee pain and anxiety and weak negative correlation between knee pain and depression. All the administered medicinal therapies to relieve osteoarthritis associated joint pain, targets only the organic background of the disease, however the mental impairments remain untouched, uncovering the relationship between knee pain and mental health impairments could guide modification in treatment program to adopt a holistic approach. During the management of knee osteoarthritis population, special attention should be made to address anxiety and the treatment of disease related joint pain should always include relaxation techniques to impart an effective management of the pain.

Author Contributions

All the authors equally contributed for research designing, data collection, data analysis and manuscript framing.

Conflict of Interest Statement

The authors declare no conflict of interest.

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REFERENCES

- [1] Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*. 2012 Dec 15;380(9859):2197-223.
- [2] Cui A, Li H, Wang D, Zhong J, Chen Y, Lu H. Global, regional prevalence, incidence and risk factors of knee osteoarthritis in population-based studies. *EClinicalMedicine*. 2020 Dec 1;29:100587.
- [3] Pal CP, Singh P, Chaturvedi S, Pruthi KK, Vij A. Epidemiology of knee osteoarthritis in India and related factors. *Indian journal of orthopaedics*. 2016 Oct;50(5):518-22.
- [4] Briggs AM, Cross MJ, Hoy DG, Sanchez-Riera L, Blyth FM, Woolf AD, March L. Musculoskeletal health conditions represent a global threat to healthy aging: a report for the 2015 World Health Organization world report on ageing and health. *The Gerontologist*. 2016 Apr 1;56(suppl_2):S243-55.
- [5] Di Nicola V. Degenerative osteoarthritis a reversible chronic disease. *Regenerative Therapy*. 2020 Dec 1;15:149-60.
- [6] Odole AC, Ogunlana MO, Adegoke BO, Ojonima F, Useh U. Depression, pain and physical function in patients with osteoarthritis of the knee: implications for interprofessional care. *Nigerian Journal of Medical Rehabilitation*. 2015 Jun 21.

- [7] Neogi T. The epidemiology and impact of pain in osteoarthritis. *Osteoarthritis and cartilage*. 2013 Sep 1;21(9):1145-53.
- [8] Hsu H, Siwiec RM. Knee osteoarthritis.
- [9] Patten SB, Williams JV, Wang J. Mental disorders in a population sample with musculoskeletal disorders. *BMC musculoskeletal disorders*. 2006 Dec;7(1):1-0.
- [10] Axford J, Butt A, Heron C, Hammond J, Morgan J, Alavi A, Bolton J, Bland M. Prevalence of anxiety and depression in osteoarthritis: use of the Hospital Anxiety and Depression Scale as a screening tool. *Clinical rheumatology*. 2010 Nov;29(11):1277-83.
- [11] Tiwari SC, Pandey NM. Health care challenges of indian older adults with special reference to mental health: An overview. *Austin Palliat Care*. 2016;1(1):1005.
- [12] McCaffery M, Beebe A. The numeric pain rating scale instructions. *Pain: Clinic Manual for Nursing Practice*. 1989.
- [13] Snaith RP. The hospital anxiety and depression scale. *Health and quality of life outcomes*. 2003 Dec;1(1):1-4.
- [14] Van Baar ME, Dekker J, Lemmens JA, Oostendorp RA, Bijlsma JW. Pain and disability in patients with osteoarthritis of hip or knee: the relationship with articular, kinesiological, and psychological characteristics. *The Journal of rheumatology*. 1998 Jan 1;25(1):125-33.
- [15] Creamer P, Lethbridge- Cejku M, Costa P, Tobin JD, Herbst JH, Hochberg MC. The relationship of anxiety and depression with self- reported knee pain in the community: data from the Baltimore Longitudinal Study of Aging. *Arthritis Care & Research*. 1999 Feb;12(1):3-7.
- [16] Peat G, Thomas E. When knee pain becomes severe: a nested case-control analysis in community-dwelling older adults. *The Journal of Pain*. 2009 Aug 1;10(8):798-808.