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# PAIN AND DEPRESSION IN PATIENTS WITH OSTEOARTHRITIS – AN EPIDEMIOLOGICAL STUDY

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**ABSTRACT**
Osteoarthritis (OA) is the most common form of arthritis. It is a disease that affects all the tissues of the joint, including the cartilage, bone, ligaments, and muscles. It can develop in any number of joints, but most commonly affects the knees, hands, and hips. A prospective observational study In MGMH, Warangal with sample size of 400-500 subjects for six month. In the present study, subjects aged 50 years and above were shown as significantly high OA risk among the elderly. Based on our research on preferring a standard pain evaluating scale, many studies have shown a peremptory response towards the WOMAC Osteoarthritis index scale that has proved significantly more responsive, especially in the measurement of function. Theimpact of depression on patients with OA has been documented in many aspects: despite the impact on quality of life, depression has been revealed as a negative predictor of the outcome of surgical interventions and interventions aimed at physical activity.

**Keywords:** Osteoarthritis (OA), WOMAC Osteoarthritis index scale and osteophytic lipping.

## INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis. It is a disease that affects all the tissues of the joint, including the cartilage, bone, ligaments, and muscles. It can develop in any number of joints, but most commonly affects the knees, hands, and hips[1]. It is a disease that damages the slippery tissue that covers the ends of bones in a joint [2]. In normal joints, a firm, rubbery material called cartilage covers the end of each bone. Cartilage provides a smooth, gliding surface for joint motion and acts as a cushion between the bones. In OA, the cartilage breaks down, causing pain, swelling and problems moving the joint[4].

Osteoarthritis first shows itself as a change to the biological processes within a joint, followed by abnormal changes to the joint itself (such as the breakdown of cartilage, bone reshaping, bony lumps, joint inflammation, loss of joint function). This can result in pain, stiffness and loss of movement[3].

As OA worsens over time, bones may break down and develop growths called spurs. Bits of bone or cartilage may chip off and float around in the joint. In the body, an inflammatory process occurs and cytokines (proteins) and enzymes develop that further damage the cartilage. In the final stages of OA, the cartilage wears away and bone rubs against bone leading to joint damage and more pain[4]. OA is considered a chronic (long-lasting) disease and other than joint replacement surgery there is presently no cure. There are, however, treatments that can reduce pain, improve function, and in some

instances delay the progression of the disease[1].

## Stages of Osteoarthritis[5]

The Kellgren and Lawrence system **is** a common method of classifying the severity of knee (OA) using five grades. This classification was proposed by Kellgren et al. in 1957and later accepted by WHO in 1961.
Grade 0: no radiographic features of OA are present
Grade 1: doubtful joint space narrowing (JSN) and possible osteophytic lipping
Grade 2: definite osteophytes and possible JSN on anteroposterior weight-bearing radiograph
Grade 3: multiple osteophytes, definite JSN, sclerosis, possible bony deformity
Grade 4: large osteophytes, marked JSN, severe sclerosis and definite bony deformity.

## Global Status of Osteoarthritis

OA accounts as most prevalent musculoskeletal disease among the world (Felson DT *et al*, 1998), and is most common reasons of joint disability in approximately 100 million people among world having age over 45 years (Hinman RS *et al*, 2010), which is approximately 15% of all musculoskeletal disorders (National Collaborating Centre for Chronic Conditions, 2008) (figure-1). More than 50% population over 65 years have radiographic confirmation of OA in any of the joints and younger population is prone to injury-induced OA.
Europe and USA reflect highest worldwide frequency of OA (Haq I *et al*, 2003). 18% of women and 9.6% of men are universally reported with symptomatic OA in 60 years and higher age group (Wolf AD *et al*, 2003). Globally Knee OA is 4th most significant cause of incapability in women and 8th in men (Azad CS *et al*, 2015). The EULAR (European League against Rheumatism) report expresses 30% radiographic evidence of knee OA over the age of 65 years (Jordan KM *et al*, 2003).

## Osteoarthritis grade in India

In Indian impact, nearly 80% of population shows OA among the patient who claimed for knee pain, out of which approximately 20% reported incapability in daily activities and around 11% need peculiar care (Hinman RS Ringdahl E *et al*, 2011). Approximately 40% population of more than 70 years shows OA, in which nearly 2% have severe knee pain and disability (Jain S, 2011). Increment in age exponentially increases the allied risk of OA, due to progressive changes in routine diet, working milieu conditions and lifestyle patterns

*et al*, 2011). The incidence of knee OA increase 10 folds amongst the ages of 30 and 65 years (Magrans C T *et al* distribution/contribution of OA in different states in India reported in figure-3. A survey based study reveals that, "India is predicted as chronic disease capital by 2025 have 60 million people with arthritis" (Jain S, 2011).

1. Patients of age between 25-80 years who are diagnosed as osteoarthritis.
2. Patients who are receiving treatment for osteoarthritis.
3. Subjects who are accessible through consent and cooperate to this study.

## MATERIALS AND METHODS

A prospective observational study In MGMH, Warangal with sample size of 400-500 subjects for six months. Patients of age between 25-80 years who are diagnosed as osteoarthritis. Patients who are receiving treatment for osteoarthritis. Subjects who are accessible through consent and cooperate to this study. Patients who are not receiving treatment for osteoarthritis. Subjects who are not willing to participate in this study. Subjects who are psychologically ill, deaf and non-cooperative to this study. The data collection form includes all the patient's required details along with the WOMAC OSTEOARTHIRITIS INDEX (WOMAC) (26 questions) and PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

## RESULTS AND DISCUSSION

### Fig. 1: Description of various age groups of study participants (N=523)

Many studies showed increasing age to be a risk factor for OA. Females had high WOMAC score percentage (56.6%) compared to Males (43.4%). This was consistent with higher incidence rates of knee OA in women than men with high risk WOMAC score percentage.

### Fig. 2: Frequency of co-morbid conditions associated with Osteoarthritis in study participants (N=523)

There is mixed evidence of the association of hypertension, diabetes and obesity with the onset of knee OA with few showing significant positive association and few revealing no association. Our study shows a relatively positive significance between the chronic diseases like hypertension, diabetes and obesity with osteoarthritis. Other chronic diseases like thyroid disorders were not found to have any effect on WOMAC scores in the study.

### Fig. 3: Total Score of PHQ-9 (Out of 27)

The **PHQ-9** is a completely self administered questionnaire that enables screening for depression and assessment of depression severity. For each of the 9 depressive symptoms according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (22), patients indicated whether, during the previous 2 weeks, the symptom had bothered them "notatall,""several days,""more than half the days," or" nearly everyday," yielding as core of 0–3.The PHQ-9 severity score thus ranges from 0 to 27.

**Table 1: Frequency of psychological problems among the participants (N=523)**

Regarding the PHQ-9, 227 men (43.4%) and 296women (56.6%).
The categories of depression severity according to the PHQ9 are displayed in Table5 with the categories
None-Score 1–4,
Mild-Score 5–9,
Moderate-Score 10–14,
Moderately severe-Score 15–19,
And Severe-Score 20–27.
73 (13.9%) participants were classified as not depressed. With as core of 10; 140 (26.7%) participants were depressed. Using a cut off score of 15, a total of 174 (33.2%) patients and with a cut off score of 20; 136 (26%) participants were classified as extremely depressed.

**Table 2: Severity of pains**

**Fig. 4: The following questions concern physical function. By this we mean ability to move around and to look after yourself. For each of the following activities, please indicate the degree of difficulty you have experienced in the last 48hours, in your knees. What degree of difficulty do you have with.**

Females had a high WOMAC score percentage (56.6%) compared to The study also shown the increased risk of affecting the body part involved in OA is right knee (50.3%) exhibiting typical pain while waking at night (timing of pain) (49.8%). Patients experienced more pain while walking on a flat surface (quantity of pain) (50.4%) and observed severe difficulty (physical function with a degree of difficulty) in performing light domestic duties (such as tidying a room, dusting, cooking) (53.9%) and extreme difficulty in performing heavy domestic duties (moving in the lawn, lifting heavy grocery bags) (40.3%). There is also evidence that specific occupations were risk factors for knee pain, for example, farming, construction work, standing (>2 h per day).

There is combined evidence showing the association between hypertension, diabetes, and obesity with OA with few showing significant positive associations and few revealing no association. Our study shows relatively positive significance between chronic diseases like hypertension (35.1%), diabetes (15.7%), and overweight/obesity (35.9%) with OA.

Based on earlier findings showing biological differences (e.g. regarding the destruction of the cartilage) and psychological differences (e.g. perception of pain), we hypothesized that men and women differ regarding many aspects of QoL and received care. This hypothesis could be confirmed. OA has a higher impact on women in important aspects of QoL such as pain, disability, and mood. Similar gender differences have been found e.g. by Woo et al. among Chinese people.

Most of the patients received NSAID (Diclofenac 50 mg), calcium 500 mg, and multivitamin tablets for the treatment of OA and tended to have less intraarticular injections in our study.

In the present study, we utilized the PHQ-9 scale to evaluate the impact of depression in OA patients. The PHQ-9 is a completely self-administered questionnaire that enables screening for depression and assessment of depression severity. For each of the 9 depressive symptoms according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (22), patients indicated whether, during the previous 2 weeks, the symptom had bothered them "not at all," "several days," "more than half the days," or "nearly every day," yielding a score of 0–3. The PHQ-9 severity score thus ranges from 0 to 27.

Regarding the PHQ-9, 227 men (43.4%) and 296 women (56.6%) answered all 9 items. The categories of depression severity according to the PHQ-9 are displayed in Table 5 with the categories none (score 1–4), mild (score 5–9), moderate (score 10–14), moderately severe (score 15–19), and severe (score 20–27). 73 (13.9%) participants were classified as not depressed. With a score of 10; 140 (26.7%) participants were depressed. Using a cut-off score of 15, a total of 174 (33.2%) patients and with a cut-off score of 20; 136 (26%) participants were classified as extremely depressed.

**CONCLUSION**
In conclusion, the impact of depression on patients with OA has been documented in many aspects, despite the impact on the

quality of life, depression has been revealed as a negative predictor of the outcome of surgical interventions and interventions aimed at physical activity. As in the general population, depression influences consulting behaviour and increases health service utilization. In contrast, previous findings indicate that physicians overestimate structural changes in OA and underestimate the contribution of depression to pain perception, functional ability, and quality of life. Furthermore, previous studies have demonstrated that improved depression care can improve pain and functional ability among patients with OA.

## ACKNOWLEDGMENT

**Table 1: Frequency of psychological problems among the participants (N=523)**

| S.No | Question | No tatall(0) | Several days(1) | More than half the days(2) | Nearly every day (3) |
|---|---|---|---|---|---|
| 1 | Little interest or pleasure in doing things | 0.76% | 5.35% | 29.83% | 64.05% |
| 2 | Feeling down, depressed, orhopeless | 0.19% | 12.24% | 30.59% | 56.98% |
| 3 | Trouble falling or staying asleep,or sleeping too much | 0.96% | 16.06% | 35.76% | 47.23% |
| 4 | Feeling tired or having little energy | 0.96% | 24.86% | 40.73% | 33.46% |
| 5 | Poor appetite or overeating | 3.25% | 22.56% | 48.18% | 26.00% |
| 6 | Feeling bad about yourself or that you are a failure or have let yourself or your family down | 13.58% | 23.14% | 47.80% | 15.49% |
| 7 | Trouble concentrating on things, such as reading the news paper or watching television | 27.15% | 24.47% | 37.28% | 11.09% |
| 8 | Moving or speaking so slowly that other people could have noticed. Or the opposite being so figety or restless that you have been moving around a lot more than usual | 49.52% | 25.24% | 20.08% | 5.16% |
| 9 | Thoughts that you would be better off dead, or of hurting yourself in someway | 71.70% | 19.31% | 8.99% | 0.00% |

**Table 2: Severity of pains**

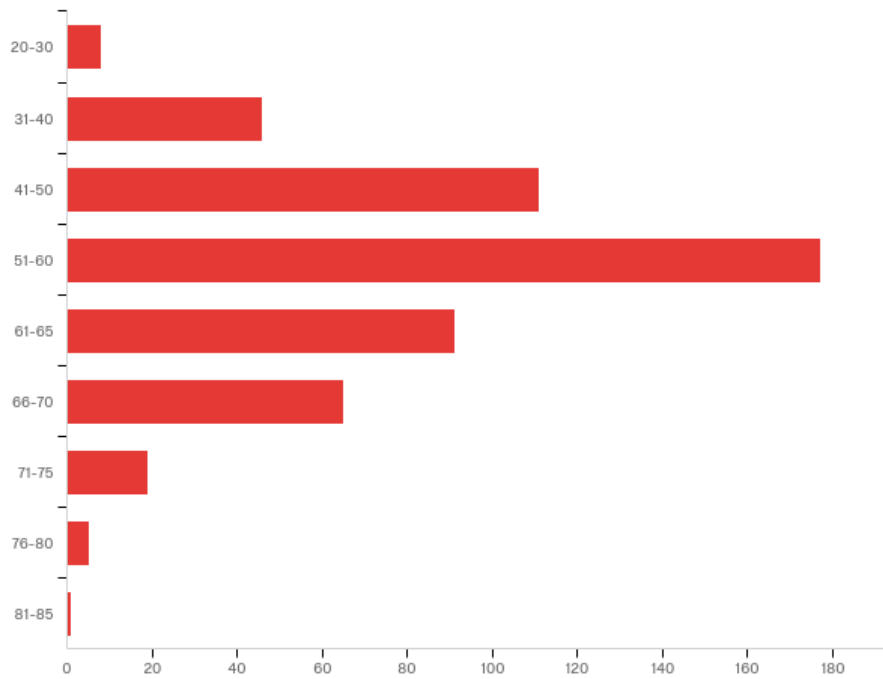| S.No | Variable | % | |
|---|---|---|---|
| 01. | **Body part involved in OA** | | |
| | | Right | Left |
| | Neck | 9.04% | 5.97% |
| | Shoulder | 10.26% | 4.29% |
| | Elbow | 1.15% | 0.76% |
| | Hip | 16.37% | 14.57% |
| | Knee | 50.36% | 49.43% |
| | Spine | 6.29% | 5.94% |
| | Wrist | 1.70% | 1.51% |
| | Ankle | 0.57% | 0.95% |
| 02. | **Quality of pain** | | |
| | Sharp | 3.23% | |
| | Dull with aching | 3.53% | |
| | Stabbing | 49.36% | |
| | Throbbing | 43.19% | |
| | Burning | 0.69% | |
| 03. | **Timing of pain** | | |
| | Constant | 36.56% | |
| | Infrequent | 13.63% | |
| | Waking at night | 49.81% | |
| 04. | **Pain control measures by patients** | | |
| | Rest | 50.98% | |
| | Ice | 0.39% | |
| | Elevation | 0.00% | |
| | Medication | 48.62% | |

**Fig. 1: Description of various age groups
of study participants (N=523)**



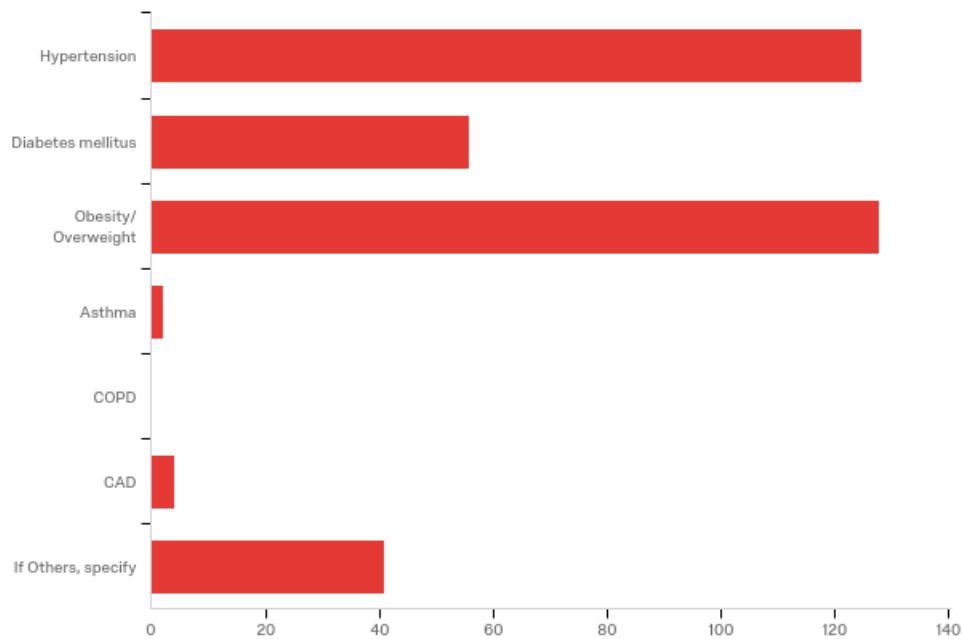**Fig. 2: Frequency of co-morbid conditions associated with
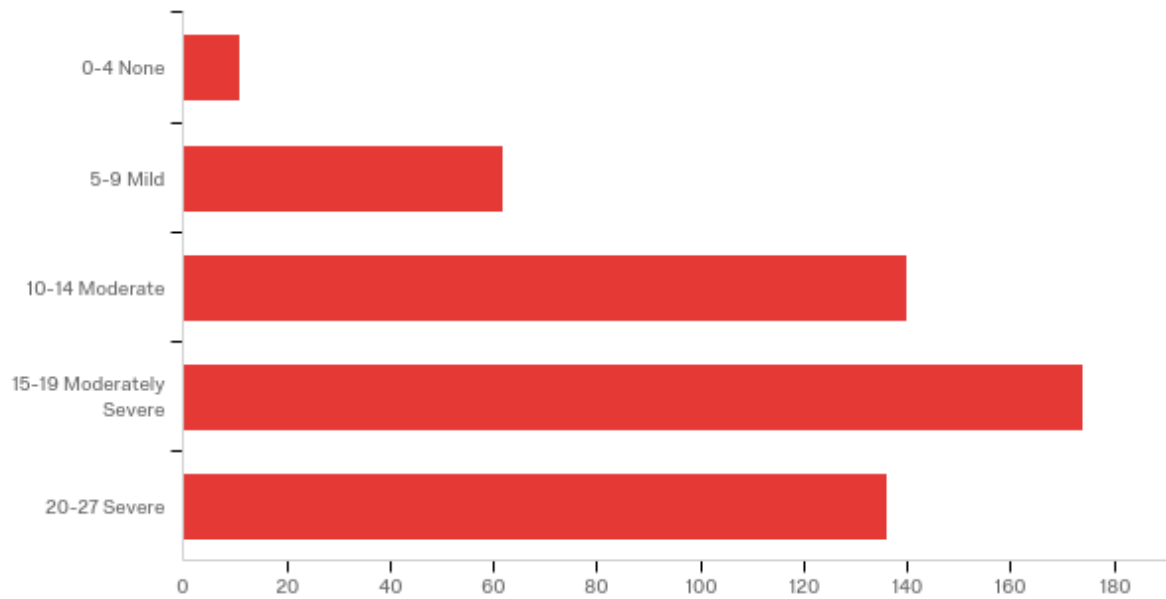Osteoarthritis in study participants (N=523)**

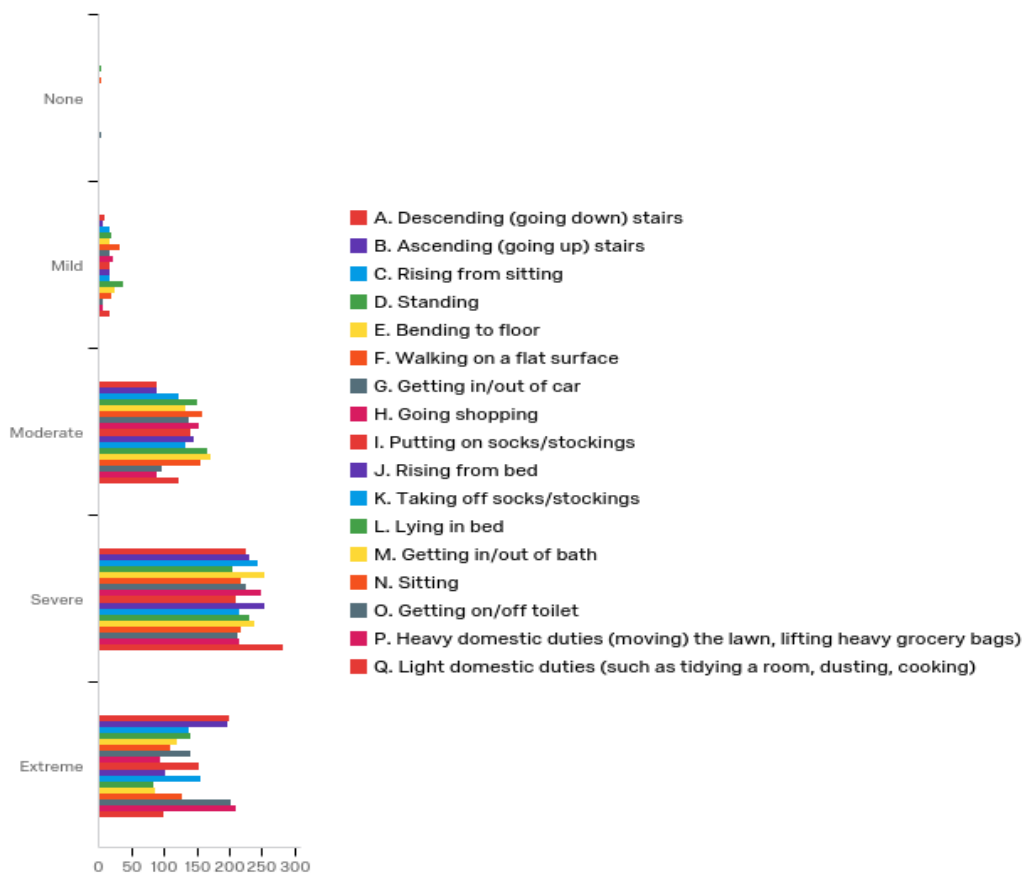**Fig. 3: TotalScoreofPHQ-9 (Out of 27)**



**Fig. 4: The following questions concern physical function. By this we mean ability to move around and to look after yourself. For each of the following activities, please indicate the degree of difficulty you have experienced in the last 48hours, in your knees. What degree of difficulty do you have with.**

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