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## PHYSIOTHERAPY MANAGEMENT OF OSTEOATHRITIS OF THE KNEE USING WHO-ICF MODEL- A CASE REPORT

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### **ABSTRACT**

The World Health Organization (WHO's) International Classification of Functioning, Disability and Health (ICF) has been proposed as a framework for developing diagnostic classifications for rehabilitation professionals. The model is gaining recognition in rehabilitation practice worldwide because it provides a useful tool in clinical decision making. It directs practitioners to address patient's problem at the level of the whole person, with modifications made on basis of health conditions and personal and environmental factors. The ICF framework provides a conceptual basis and a universal common language for understanding and describing patient's health status, reaching beyond mortality, disease, and medical diagnoses. It promotes a comprehensive multidisciplinary and patient-centered perspective in health care; and has been accepted and applied in the various aspect of rehabilitation to facilitate multidisciplinary team communication, to structure the rehabilitation process, for goal setting and assessment, for documentation and for reporting, but it is not widely used in most rehabilitation settings in Nigeria. The purpose of this case report is to describe an evaluative and diagnostic process that is based on the ICF framework for a patient with bilateral osteoarthritis of the knee.

**Keyword: Osteoarthritis, Physiotherapy, WHO-ICF**

### **INTRODUCTION**

The International Classification of Functioning, disability and Health (ICF) has been proposed by World Health Organization (WHO) as a unified framework for describing the health status of people (Fig.1).<sup>[1]</sup> It is accepted in physiotherapy as a possible framework for organizing and directing treatment of patient and clients<sup>[2]</sup> but it is not widely used in most rehabilitation settings in Nigeria. In this case report, a process of applying the components of ICF model for a patient with osteoarthritis of the knee is described. Osteoarthritis is a chronic joint disorder in which there is progressive softening and disintegration of articulate cartilage accompanied by new growth of cartilage and bone at the joint margins (Osteophytes) and capsular fibrosis<sup>[3]</sup>. Usually it results from a disparity between the stress applied to articulate cartilage and the ability of the cartilage to withstand that stress. The knee is the commonest site for osteoarthritis. Common predisposing factors include pre-existing knee deformity, injury to the articulate surface and ligamentous instability. However, in some cases no obvious cause can be found and in such instance bilateral presentation is common. Common clinical features include i) Pain ii) Swelling, iii) Long-standing bow leg deformity, iv) Joint stiffness after rest, v) weakness of the quadriceps (in long-standing cases) vi) impaired movement and vii) Patello-femoral crepitus. Principle of conservative management focuses on relieving pain, increasing movement and reducing load.

## **HISTORY**

The patient was a 67 year old woman with major complain of 6 months history of pains and stiffness of both knees. She reported insidious onset of symptoms that had become worsened and constant for about 3 months Patient was seen by the orthopedic team and a diagnosis was made. She was placed on analgesic which eased the pain temporarily. Despite this, the pain level at rest was worsening and increasingly affecting her routine activity adversely, hence she was referred for physiotherapy management. Pain intensity was measured using visual analogue scale, and at onset was rated 5/10 on the right knee and 6/10 on the left knee. When pain intensity is at worst, patient rated it to be 7/10 on the right and 9/10 on the left knee, while when pain is least, she rated it to be 4/10 and 5/10 on the right and left knee respectively. Lifting, bending forward, prolong sitting for more than 20 minutes aggravated the pain [perception. Patient described the symptoms as varying from day to day, but typically worse at the start of the day with associated stiffness. She estimated that her sleep was interrupted by 30% of the time and her daily and leisure activities by 70% due to the knee pain. Symptoms were eased by heat and prescribed analgesic. Associated symptoms include stiffness of both knee worse on the right, and an intermittent aching to throbbing pain radiating to the medial aspect of both knees. She also reported associated swelling of the left knee following prolonged sitting for more than 45 minutes. There was no associated pedal oedema, or generalized weakness but sometime experience, 'clumsiness' in her knees while walking. Other medical history included resolved shoulder pain; admission for caesarian section, patient is not a known hypertensive or diabetic nor asthmatic patient, with no history of previous blood transfusion. Patient is a teacher and her routine activities include walking, climbing stairs, traveling and sitting at computer. She enjoys social functions and gardening during leisure time. Her goals were to return to her routine and leisure activities with a pain level of < 3/10

## **EXAMINATION**

A vital sign of the patient was stable with a blood pressure of 129/88mmHg in sitting position, Pulse rate of 78 beats per minutes and respiratory rate of 18 cycles per minute. Patient was observed to have mild swelling of the left knee with associated tenderness in the medial aspect. Myotomal and dermatomal functions were normal, with normal muscle bulk and muscle tone for both lower limb muscles. Straight leg raising (Flexion of the hip) elicited pain bilaterally at the hamstrings. Normal thoracic and lumbar spinal curvatures were observed. Muscle power of both hamstrings quadriceps, were 5 using the oxford grading technique. Anthropometric measurement showed a BMI of 32, waist circumference of 97.5cm, the circumference of 117cm and waist-Hip-Ratio of 0.82. Crepitus were observed at both knees on passive flexion, patient could not squat. Posture is standing and walking with typical antalgic gait after sitting for about 30 minutes. Goniometry was conducted and showed active range of motion (NCOM) of knee flexion was lacking 10 at the right and 13 at the left knee. AROM had soft-tissue end-feel, while passive range of motion (PROM) was full but painful at end-range.

## EVALUATION

Based on the initial examination data, the factors affecting the patient's bilateral Osteoarthritis were classified using the WHO-ICF model (Table I). It was hypothesized that pain and muscle guarding observed at both knee resulted in compromised knee joint stability causing limitations in the activities of climbing stairs, prolonged standing, prolonged sitting and squatting. Difficulties with these activities were thought to negatively affect her participation in her part-time teaching appointment, routine and social activities. These were also perceived to be involved in a cycle that further promoted impaired function of soft tissue, stability and flexibility at both knee. It was also thought that the patient exhibited a personal factor of fear avoidance behavior which indirectly impacted her activity limitations. The Pain the patient experienced during these activities reinforces her fear avoidance tracts towards them. This constituted a potential barrier to her physical activities and undermines her self efficacy concerning her routine and leisure time activities. Her work environment involves standing to teach for an average of 2 hours and the transportation distance from her house to lecture venue requires her to sit for well over an hour. These are environmental factors that may have adversely influence her participation in her work duties.

## Principle of Management

The principle of care of this patient were

- i) Relieve pain
- ii) Increase range of movement
- iii) Reduce load

**Pain management:-** This is usually achieved massage with topical non-steroid anti-inflammatory gel; Cry therapy, Rest periods, modifications of activities ad necessary.

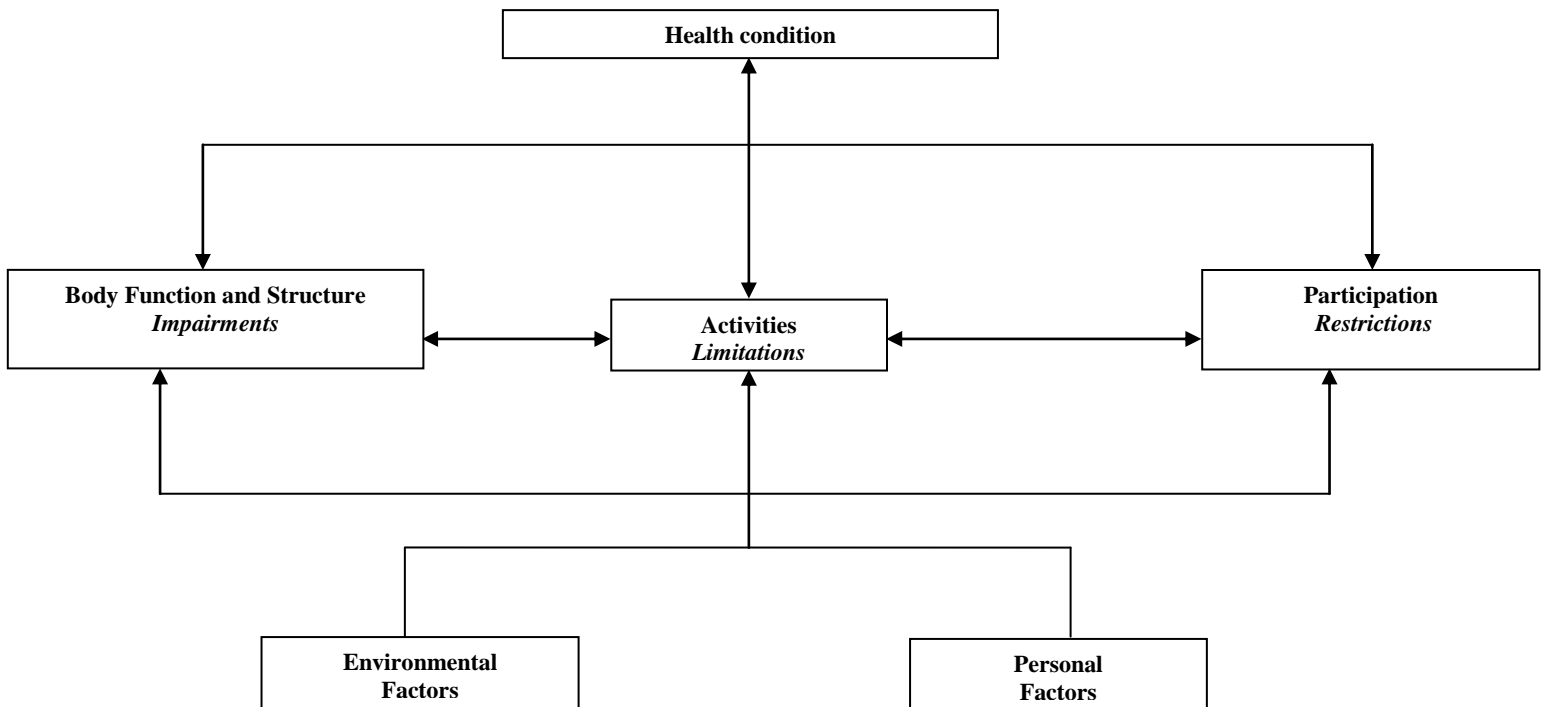
**Joint mobility:** This was aimed at improving the range of motion (active) to consequently reduce pain and improve function

**Load Reduction:-** This was aimed at reducing the load the painful joint is exposed to this is usually achieved using walking stick, wearing of soft-soled shoes, avoiding prolonged, stressful activity and by weight reduction.

## Intervention

The patient was educated on her physiotherapist diagnosis and plan of care. She was seen for 12 visits over 12 weeks. Patient education and graded exercise were sued to address the fear avoidance of physical activity. She was also advised to maintain a consistent activity level as tolerable. This was reinforced during subsequent visits. Treatment plan included pain management with cry therapy for tenderness and swelling at the left knee, short wave diathermancy for 15 minutes at 65% intensity using Pulse-mode, flexibility exercise of hamstring stretching (Passive and active), open-chain mobilization exercise of both lower extremities. Patient was also advised on weight reduction program and introduced to a gradually progressed endurance exercise comprising of walking and bicycle ergometry.

Patient was counseled on back care and lifestyle including dietary habit. Graded exercise consisted of daily walking program for 15 minutes and progressed with duration every other day till maximum of 30 minutes.



**Figure 1.**

Components and definition of International Classification of Functioning, Disability and Health (ICF) model [4]. Health condition=umbrella term for disease, disorders, injuries, or traumas; body function= physiological functions of the body systems; body structure= anatomic parts of the body; impairments= problems in body function or structure, such as significant deviation or loss; activities= execution of tasks or actions by an individual; activities limitation= difficulties an individual may face in executing activities; participation= involvement in a life situation; participation restrictions= problems an individual may experience in involvement in life situations; environmental factors= physical, social, and attitudinal environments in which people live and conduct their lives; personal factors= particular background of an individual's life and living, comprising features of an individual that is not part of health condition. (International Classification of Functioning, Disability and Health (ICF).Geneva, Switzerland: World Health Organization; 2001)

**Table 1**

The World Health Organization International Classification of Functioning Disability and Health (WHO-ICF) model applied to the Evaluation of Patient with bilateral Osteoarthritis of the knee.

|                         | <b>Body Structure &amp; Function</b>   | <b>Activities</b>   | <b>Participation</b>   |
|-------------------------|--|---|--|
| Patients Perspective    | *Pain at both knees<br>*Stiffness of both knee Joints  | *Prolonged standing<br>*Prolonged Sitting<br>*Climbing Stairs | *Reduce work tolerance<br>*Reduce traveling<br>*Reduce social functions<br>*Contributed to resignation of previous locum appointment |
| Therapist's Perspective | *Reduced flexibility of hip joint.<br>* Swollen left knee<br>*Reduced joint function<br>Gait Affection | *Squatting<br>*Prolonged Standing<br>*Prolonged sitting       | *Reimbursement & Employment Issues<br>*Recreation & Leisure<br>*Participation<br>*Quality of life                                    |

**CONTEXTUAL FACTORS**

**Personal:** Temperature & Personality Trait of fear – Avoidance behavior for physical activities.  
Reduced perceived ability to function in ADL % work-related activities

**Environmental:**

- Get a driver
- Knee support
- Walking stick
- Sit while delivering lecture
- Adjust room for leg space while sitting in car (>20minutes)

**Outcomes**

At 6 weeks, the patient was reviewed and observed to have no swelling or tenderness at the knees. Patient reported pain intensity at worst to be 5/10 both knees, and that she was able to sit for over an hour without increased pain and climb stairs more frequently without increase in pain. Patient noted that this has improved her work and social participation. Flexion of the hip was full without pain and tightness at both hamstrings. Anthropometric measurement showed reduction in body weight to 81.5kg and BM1 of approximately 31. At 12 weeks, patient reported that she was able to sit for about 2 hours behind her computer and go through her routine activities for a full day without increase in pain. She regularly climbs stairs without pain. Pain intensity was reported to be 3/10 using VAS.

Anthropometric measurement showed reduction of 5kg in body weight and a BMI of 30. Goniometric test showed both AROM and PROM of both knees to be full and pain free. Patient also reported an improvement in her gait as she felt more 'agile' and 'walk better and faster without previous 'clumsiness'. Following the evaluation at the end of the 12<sup>th</sup> week, patient was satisfied with the outcome of the treatment. She was discharged at her request and instructed on home program which included walking exercise for maintenance of weight and cardiorespiratory endurance.

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