

# Assessment of validity, reliability, and feasibility of OMERACT ultrasound knee osteoarthritis scores in Egyptian patients with primary knee osteoarthritis

## Abstract

**Background** Ultrasound (US) can evaluate all joint components affected by knee osteoarthritis (KOA); however, standardized scoring of US-detected pathology is needed to improve its diagnostic and monitoring capabilities.

**Objectives** To examine the validity, reliability, and feasibility of the Outcome Measures in Rheumatology (OMERACT) ultrasound scoring for KOA, comparing with clinical and radiography measures, using predefined cutoff values.

**Methods** This cross-sectional study included 75 Egyptian patients with primary KOA. All patients had Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score, bilateral knee radiography, and ultrasonography. Interobserver reliability of ultrasound was evaluated in 30 knees by another newly trained operator.

**Results** Most of the OMERACT-US KOA scores showed significant associations with WOMAC clinical scores, except for femoral cartilage damage and effusion. The synovitis score was significantly associated with WOMAC–pain score ( $p$ -value 0.046), while medial meniscus extrusion (MME) and medial osteophytes were significantly associated with WOMAC–stiffness score ( $p$ -value 0.009 and 0.023, respectively). MME and synovitis were significantly associated with WOMAC–physical score ( $p$ -value 0.035 and 0.020, respectively). The ultrasound scores also showed a strong correlation with radiographic scoring. Inter-observer reliability ranged from moderate to excellent agreement ( $k = 0.58$  to  $k = 0.83$ ); it was highest for lateral osteophytes ( $k = 0.83$ ), good agreement for synovitis ( $k = 0.72$ ), any osteophytes ( $k = 0.71$ ), damage of femoral cartilage ( $k = 0.70$ ), and moderate agreement for medial osteophytes ( $k = 0.58$ ) and MME ( $k = 0.59$ ).

**Conclusion** OMERACT-US scoring system for KOA demonstrated validity, reliability, and feasibility for evaluating both structural and inflammatory components. Using cutoff values improved the scoring reliability for osteophytes and MME.

**Key Points**

- *OMERACT-US scores provide a valid assessment of inflammatory and structural components of knee osteoarthritis.*
- *The following changes may improve the performance of the OMERACT-US scores.*
  - a. *The binary score for effusion and synovial hypertrophy can be omitted, as they have no added value.*
  - b. *A semi-quantitative grading for effusion may capture the impact of effusion on clinical outcomes.*
  - c. *Added cutoff values to score medial meniscal extrusion, osteophytes, and pathological effusion improved the respective scores' reliability.*
  - d. *Applying the updated OMERACT definition of synovitis.*
- *OMERACT-US scores are reliable to be used with a newly trained operator, particularly when cutoff values are included, and proper training time is provided.*
- *The OMERACT-US score is feasible to be used in clinical practice, as the time taken to perform was short, even for a newly trained operator.*