

## ABSTRACT

**Background:** Osteoarthritis (OA) is the most common joint disease worldwide, strongly impacting individual and population health. Globally, the prevalence of OA increased by 113.2% from 247.5 million in 1990 to 527.8 million in 2019. The prevalence of OA in Indonesia increases with age, namely by 5% in individuals under 40 years, 30% in those aged 40-60 years, and 65% in those over 60 years. The incidence of knee OA is relatively high, namely 15.5% in men and 12.7% in women. This disease can cause chronic pain and disability and reduce the quality of life of sufferers. High levels of pro-inflammatory cytokines such as TNF- $\alpha$  in OA sufferers can significantly induce chondrocyte death and inhibit differentiation and proliferation.

**Objective:** To analyze the effect of omega-3 fatty acid supplementation on TNF- $\alpha$  levels and pain intensity in patients with Osteoarthritis.

**Method:** This study was a quasi-experimental single-group design with a one-group pre-post test without a control group design in 31 patients. Data collected were anthropometric measurements, blood sampling, and pain score measurements twice, namely before and after the intervention. TNF- $\alpha$  analysis used an Enzyme-Linked Immunosorbent Assay (Elisa), while pain intensity was measured using a numeric rating scale (NRS). Statistical analysis of the effect of omega-3 fatty acid supplementation on TNF- $\alpha$  levels and pain intensity was performed using Wilcoxon test.

**Results:** The results obtained on TNF- $\alpha$  ( $p$ -value = 0.007) and pain intensity ( $p$ -value = 0.001) were significant.

**Conclusion:** Supplementation of omega-3 fatty acids in OA patients can produce several anti-inflammatory mediators that significantly reduce pro-inflammatory cytokines TNF- $\alpha$  and pain intensity.

**KEYWORDS:** Omega-3 fatty acids; Tumor Necrosis Alpha (TNF- $\alpha$ ); Pain intensity; Inflammation; Osteoarthritis