

Critical Methodological Concerns: Enhancing Rigor in “Research on the Developmental Trajectory of Movement-Evoked Pain After Knee Arthroplasty” [Letter]

Ke Zhang, Jia-Wen Wang, Ji-Tao Liu

Hanzhong People's Hospital, Hanzhong City, Shaanxi Province, 723000, People's Republic of China

Correspondence: Ji-Tao Liu, Hanzhong People's Hospital, 251 North Tuanjie Street, Hantai District, Hanzhong City, Shaanxi Province, 723000, People's Republic of China, Email bluceliu123@163.com

Dear editor

Recently, we read with great interest the article entitled “Trajectories and Predictors of Movement-Evoked Pain After Total Knee Arthroplasty” published in your esteemed journal.¹ This study enrolled 178 patients undergoing total knee arthroplasty (TKA) and assessed their movement-evoked pain and its intensity at 24, 48, and 72 hours postoperatively. A growth mixture model was constructed to identify three distinct pain trajectories, and the study further explored predictors such as social support, pain catastrophizing, and educational attainment, which provides important theoretical support for individualized pain management and early rehabilitation strategies in clinical practice. However, key methodological issues in patient selection, confounder control, and statistical analysis may weaken the study's reliability and clinical relevance.

First, the inclusion criteria are insufficiently defined. The authors only mention that participants were diagnosed according to the 2021 guidelines for osteoarthritis and underwent TKA. However, patients with severe preoperative pain and lower functional scores often experience more pronounced postoperative pain symptoms.² The lack of specific inclusion criteria likely led to significant heterogeneity in the patient population, thereby undermining the accuracy of trajectory classification. It is recommended to use standardized tools such as the Oxford Knee Score (OKS) or the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) to clearly define preoperative functional status.³

Second, the exclusion criteria are overly general. The article merely states that patients with “serious comorbidities such as heart disease or cancer, or those unwilling to participate” were excluded, without providing detailed evaluation standards. For instance, patients with severe osteoporosis are more likely to experience intense postoperative pain compared to those without osteoporosis,⁴ and such high-risk patients are common in clinical settings. Including these patients without stratification could bias the risk assessment of postoperative pain. It is recommended that common risk factors such as diabetes, high BMI, and severe osteoporosis be incorporated into the exclusion criteria.⁵

Moreover, factors such as age, sex, and duration of surgery can significantly influence postoperative recovery and pain assessment.⁶ Failure to control these variables raises concerns about the data's reliability and compromises the validity and accuracy of pain trajectory classification. It is recommended to adopt stratified research designs to control for these confounders and improve the precision of the results.⁷

In conclusion, while the authors' exploration of movement-evoked pain trajectories is clinically valuable, its methodological limitations may impede interpretation. Implementing standardised preoperative scoring (eg, OKS/WOMAC), refining exclusion criteria, and applying stratified analyses or propensity-score matching will strengthen future investigations and improve the translational impact of their findings.

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