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Letter to the Editor

Postop Spinal Fusion Pain and the Continued Neglect of Biopsychosocial Lens in Pediatric Orthopaedics

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Abbreviations: PSF, posterior spinal fusion (PSF); AIS - adolescent idiopathic scoliosis

The recent *JPOSNA*® article by Younis et al.[1] represents a troubling, antiquated lens on chronic pain following posterior spinal fusion (PSF) that perpetuates confusion about its etiology and undermines optimal evaluation, prevention, and management. Importantly, chronic pain does not occur in a physical vacuum–it is impossible to understand how chronic pain develops after surgery using a narrow focus on tissue, inflammatory processes, or mechanical complications alone.

Instead, a biopsychosocial perspective is needed to more clearly understand the development/persistence of chronic pain and prevent acute pain from transitioning to chronic following surgery.[2] In brief, a biopsychosocial conceptualization considers the combined and multi-directional contributions between biological (e.g., genetics, hormone abnormalities, comorbid disease, inflammatory response, nociception variation), psychological (e.g., premorbid psychiatric history, expectations, pain beliefs, maladaptive coping skills, thought patterns and perceptions, mood), and socioenvironmental components (e.g., extent of social support, socioeconomic factors, culture, health literacy, relationship with medical providers, interpersonal relationships). For example, pain catastrophizing (i.e., magnifying the threat of pain) and depressive symptoms can occasion persistent pain and undermine the course of recovery following musculoskeletal surgery.[3] Persistent pain can lead to a sense of helplessness, social withdrawal, and worsening mood, which further perpetuates movement avoidance behaviors, deterioration of musculoskeletal tissue, and deconditioning.[4] The biopsychosocial perspective is far from a novel concept across the extant literature. Bevers and colleagues highlighted that it has been "the most heuristic approach to chronic pain assessment, prevention, and treatment" since the 1970s.[5] There is a wealth of knowledge in orthopaedic, rheumatologic, and neuro-mediated processes of pain, and greater attention needs to be paid to synthesizing these contributors.[4] Psychological

processes and socioenvironmental influences on pain have been well-documented for years[2,3,6,7] and even highlighted in recent articles from this very journal![8]

Given the "biopsychosocial model of pain dominates the scientific community's understanding of chronic pain"[6] and provides important opportunities for optimizing treatment, we were disappointed to see only vague and over-simplified allusions to psychological and socioenvironmental pain contributors in the Younis et al. paper.[1] We encourage the *JPOSNA*® readership at large to more deliberately consider these influences and related opportunities to enhance pain care for patients undergoing PSF, particularly given literature demonstrating comprehensive pain interventions are both cost-effective and yield better outcomes relative to traditional management.[9] Pediatric health psychologists, as inherent experts on biopsychosocial care, are arguably some of the best-positioned specialists for integration into multidisciplinary management, whether in the form of routine preoperative behavioral health workup/clearance for PSF patients or as PRN postop care. While many medical specialties have routinely taken a multidisciplinary care approach for some time,[10] it remains more the exception than the rule in pediatric orthopaedics–even in the face of literature repeatedly demonstrating prevalent behavioral health and psychosocial problems in context of AIS management/surgical intervention and related risk of postoperative complications like elevated acute pain, chronic pain, impairments in health-related quality of life, greater hospitalization length of stay and cost.[2,11-16] Pediatric orthopaedics will do a great disservice to patients and families should we continue burying our heads in the sand, knowing there are critical opportunities to mitigate problems and address modifiable factors through the biopsychosocial lens.

Disclaimer

The authors have no conflicts of interest to report.

References

1. Younis MH, Haydel AL, Saunee L, et al. Pain after spine fusion for adolescent idiopathic scoliosis. *JPOSNA*. 2022;4(2). https://www.jposna.org/ojs/index.php/jposna/article/view/381.
2. Rabbitts JA, Palermo TM, Lang EA. A conceptual model of biopsychosocial mechanisms of transition from acute to chronic postsurgical pain in children and adolescents. *J Pain Res*. 2020;13:3071-3080.
3. Simon CB, Valencia C, Coronado RA, et al. Biopsychosocial influences on shoulder pain: analyzing the temporal ordering of post-operative recovery. *J Pain*. 2020;21(7-8):808-819.
4. Langevin HM. Reconnecting the brain with the rest of the body in musculoskeletal pain research. *J Pain*. 2021;22(1):1-8.
5. Bevers K, Watts L, Kishino ND, et al. The biopsychosocial model of the assessment, prevention, and treatment of chronic pain. *US Neurol*. 2016;12(2):98-104.
6. Meints SM, Edwards RR. Evaluating psychosocial contributions to chronic pain outcomes. *Prog Neuropsychopharmacol Biol Psychiatry*. 2018;87:168-182.
7. Moseley GL, Butler DS. Fifteen years of explaining pain: the past, present, and future. *J Pain*. 2015;16(9):807-813.
8. Gornitzky A. Diab M. Coping skills in children: an introduction to the biopsychosocial model of pain control as a tool to improve postoperative outcomes. *JPOSNA*. 2021;3(1). https://jposna.org/ojs/index.php/jposna/article/view/211.
9. Gatchel RJ, Okifuji A. Evidence-based scientific data documenting the treatment and cost- effectiveness of comprehensive pain programs for chronic nonmalignant pain. *J Pain*. 2006;7(11):779-793.
10. Conroy C, Logan DDE. Pediatric multidisciplinary and interdisciplinary teams and interventions. *Clinical Practice of Pediatric Psychology*. New York, NY: Guilford; 2014:93-108.
11. Auerbach JD, Lonner BS, Crerand CE, et al. Body image in patients with adolescent idiopathic scoliosis. *J Bone Joint Surg*. 2014;96:e61.
12. Doupnik SK, Lawlor J, Zima BT, et al. Mental health conditions and medical and surgical hospital utilization. *Pediatrics*. 2016;138:e20162416.
13. Gallant J, Morgan CD, Stoklosa JB, et al. Psychosocial difficulties in adolescent idiopathic scoliosis: body image, eating behaviors, and mood disorders. *World Neurosurg*. 2018;116:421-432.
14. Lee SB, Chae HW, Kwon JW, et al. Is there an association between psychiatric disorders and adolescent idiopathic scoliosis? A large-database study. *Clin Orthop Relat Res*. 2021;479:1805-1812.
15. Mitsiaki I, Thirios A, Panagouli E, et al. Adolescent idiopathic scoliosis and mental health disorders: a narrative review of the literature. *Children*. 2022;9(5):597.
16. Rabbitts JA, Groenewald CB, Tai GG, et al. Presurgical psychosocial predictors of acute postsurgical pain and quality of life in children undergoing major surgery. *J Pain*. 2015;16:226-234.

Author Response

Pain After Spine Fusion for Adolescent Idiopathic Scoliosis

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We are delighted to see psychologists interested in the management of adolescents treated with spinal fusion. As Young and Brimeyer suggest in their letter, we wholeheartedly agree that a multidisciplinary approach to chronic pain, particularly considering biopsychosocial factors, can be extremely valuable in certain cases. However, it is important to distinguish that this model is most beneficial for the subset of patients without a correctable structural source of their pain. In our article, we attempted to review all patients with chronic pain after spinal fusion, though we admittedly focused on those with an identifiable structural etiology, such as pseudarthrosis, adding on infection, etc.[1] Of course, such issues must be excluded before ruling out surgical treatment and committing to a biopsychosocial approach.

For the subset of patients without a correctable organic etiology, we agree with Young and Brimeyer that our original article did not delve deeply enough into the multidisciplinary treatment strategies, primarily because there is still relatively limited literature on this topic in this population. However, as Young and Brimeyer imply in their letter, the body of literature on managing chronic pain through a biopsychosocial lens in other conditions can almost certainly be extrapolated to these postoperative spine patients. Moreover, relevant studies specific to this population have begun to emerge. For example, Chidambarab et al. found several psychological factors that can be identified preoperatively to predict chronic postop pain including pre-existing pain, anxiety, sensitivity, and catastrophizing.[2] These features should prompt early involvement of a psychologist or psychiatrist in the patient's care team.

In conclusion, we appreciate Young and Brimeyer's interest and strongly agree that multidisciplinary management with a psychologist or psychiatrist can be immensely beneficial for patients who develop chronic pain without a correctable structural problem, especially if initiated preoperatively. We take this team-based approach at our facility preoperatively for certain patients and postoperatively whenever pain becomes chronic without a correctable structural etiology. In a perfect world, we would favor routine preop psychology clearance for all spine surgery patients. We look forward to the literature applying the biopsychosocial model to this population growing in the future.

Disclaimer

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References

1. Younis MH, Haydel AL, Saunee L, et al. Pain after spine fusion for adolescent idiopathic scoliosis. *JPOSNA*. 2022;4(2). https://www.jposna.org/ojs/index.php/jposna/article/view/381.
2. Chidambaran V, Ding L, Moore DL, et al. Predicting the pain continuum after adolescent idiopathic scoliosis surgery: a prospective cohort study. *Eur J Pain*. 2017;21(7):1252-1265.