

War and Surgery: A Comparative Analysis of Postoperative Complications, Outcomes, and Risk Factors in Conflict and Safe Zones across Sudan, with a Proposed Predictive Model for Severity

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Abstract : Background: The global landscape has witnessed an alarming rise in armed conflicts, further devastating populations through enforced displacement, compromised infrastructure, and strained healthcare systems. In Sudan, the situation is particularly dire, with conflict exacerbating shortages in medical supplies and personnel, pushing the already fragile healthcare system into crisis, especially affecting surgical care. Initially, war impacts were significant in conflict zones like Khartoum, but since mid-April 2023, the entire country has descended into chaos. Weak monitoring and health information systems hinder accurate assessment of surgical care in conflict zones, leading to inadequate resource allocation, suboptimal care, and missed opportunities for global learning. This study investigates the impact of the Sudanese conflict on postoperative complications, exploring prevalence, types, outcomes, and psychological effects in conflict and safe areas. Methods: Conducted across 10 Sudanese states—5 in conflict zones such as Khartoum and West Darfur, and 5 in safer regions like River Nile and Kassala—this study analyzed data from 1,457 patients who underwent surgery post-April 2023. Data were collected using a pretested, mixed-mode questionnaire that incorporated elements from validated frameworks and tailored questions specific to the study's context. Hospital records and surgical logs were also used, with data analyzed via SPSS. Results: The overall prevalence of postoperative complications was 35.89%, with a higher rate in conflict zones (57.5%) compared to safe areas (26.4%). Surgical site infections predominated in conflict zones (24.7%) and higher than its prevalence in safe areas, and while fever was prevalent in safer regions even though much less compared to conflict areas, bleeding from surgical site was very frequent in conflict areas. Most patients recovered within two months at a rate higher in safe areas, but most of them required further medical or surgical management within the first month, but psychological impacts were more pronounced in conflict zones with 22.22% reported anxiety among injuries patients, and 20.6% experienced depression, 13.5% and 16.9% respectively, in those had surgeries for other medical conditions, compared to 0.22% anxiety rates and 8.1% for depression in safer regions. Risk factors included age, travel to conflict zones, access to care, delays, and comorbidities. Conclusion: Strengthening healthcare systems and ensuring accessible surgical care are critical in both conflict and safe areas. Specific attention must be given to addressing patient suffering and demographic shifts caused by armed conflict. Further research is needed to refine the predictive model for postoperative complications in conflict zones.

Keywords : postoperative complications, conflict zones, risk factors, surgical outcomes, Sudan

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