

**Abstract Title:** Sentiment Analysis of Anesthesiology & Orthopedics Clinical Trial Literature pertaining to Regional Anesthesia

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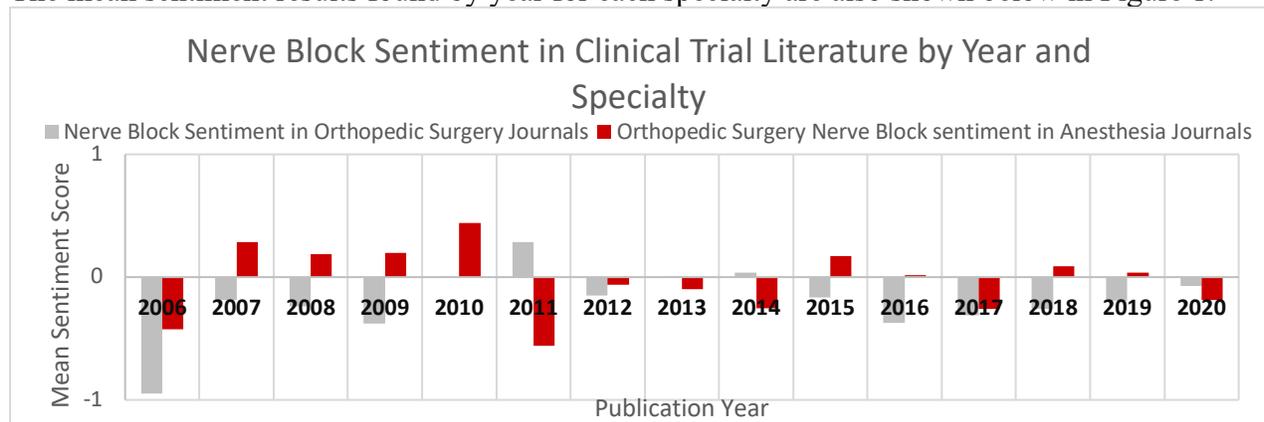
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**Introduction:** Publication bias has been established as a phenomenon that can negatively impact the provision of evidence-based patient care. Despite this, limited methodologies have been explored to quantitatively analyze this phenomenon. This study seeks to explore sentiment analysis, a type of natural language processing that assigns quantitative values to the sentiment expressed in written text, as a method to analyze this phenomenon in the context of regional anesthesia clinical trials reported in orthopedic surgery and anesthesiology journals.

**Methods:** PubMed abstract data between January 1, 2006 and October 1, 2020 from 10 high impact anesthesiology and orthopedic surgery journals was collected. To evaluate clinical trial articles focusing on the provision of regional anesthesia, the PubMed database was queried for “orthopedic surgery nerve blocks” in the case of anesthesia journals or “nerve blocks” in the case of orthopedic surgery journals. Sentiment in each abstract was then found using VADER sentiment analysis. This algorithm assigns a value from -1 (highly negative) to 1 (highly positive) to a body of text based on word-by-word sentiment within the text.

**Results:** 137 articles related to orthopedic surgery nerve blocks were identified in orthopedic surgery journals with a mean sentiment score of -0.1935 and 102 articles were identified in anesthesia journals with a mean sentiment score of 0.0252. This analysis demonstrated that a sentiment analysis focusing on nerve blocks resulted in orthopedic surgery journals displaying a significantly more negative sentiment than anesthesia journals ( $P = 0.003$ ).

The mean sentiment results found by year for each specialty are also shown below in Figure 1.



**Conclusion:** In this study, a significant difference was found in the sentiment expressed in published clinical trial abstracts between orthopedic surgery and anesthesiology literature. This suggests that there are likely specialty specific motivations that drive publication trends that warrant further investigation into potential etiologies. The study does suffer from several limitations that deserve further discussion and may limit determination of causality. Primarily, sentiment analysis is a new tool for this application that requires further validation. Additionally, the etiology of this study’s findings are multifactorial and determining the exact cause requires further analysis. Knowing this, it may be useful to evaluate how sentiment analysis and natural language processing can be integrated into current methods to address these issues.