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# Safety of creatine supplementation: a scientometrics analysis on the impact of the 'Creatine For Health' initiative and introduction to CREAS

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## ABSTRACT

**Background:** Research has consistently shown that creatine monohydrate supplementation is generally safe and well-tolerated, with no clinically significant side effects. However, anecdotal claims about adverse effects persist. In 2021, the global initiative 'Creatine for Health' was launched to bring together creatine researchers and accelerate awareness about the role of creatine supplementation in health and clinical diseases.

**Methods:** We conducted a scientometrics analysis to assess the impact of this initiative on social media and evaluate public perceptions of creatine. The goal was to determine whether these perceptions aligned with the side effects reported in scientific literature or adverse effect monitoring systems. A big data text analysis was performed using the YouTube API v3 and the Twitter/X API v2, authorized under the X Academic Research program (Project name: "Creatine Safety" – APP ID: 21590870). We employed supervised machine learning for sentiment analysis to detect and classify subjective content, using the SentiStrength algorithm within the Academic Research version of Mozdeh software. Additionally, a comparative analysis of association word mining was conducted to identify keywords statistically associated with comments containing "monohydrate" or "HCl" on YouTube. These big data text mining and social network analyses are part of the Creatine Research and Information System (CREAS), a project that integrates bibliometrics, scientometrics, and other AI-assisted analyses.

**Results:** A total of 129,782 comments were collected from YouTube videos published between April 2011 and February 2025 that included "creatine" in their title or description. Most comments exhibited no strong sentiment, suggesting they were primarily informational rather than opinion-based. Discussions on YouTube about creatine were generally neutral or slightly positive. Interestingly, comments containing the word "monohydrate" remained mostly neutral, though they had a higher percentage of weak and moderate positive sentiments. However, negative sentiments were predominant when the estimated sentiment strength was classified as strong or very strong. Notably, significant peaks in the time series analysis (July 2021, March 2022, August 2023, and September 2024) coincided with key events led by *'Creatine for Health'*. These included the special issue *"Creatine Supplementation for Health and Clinical Diseases"* (first half of 2021), the Creatine Conference 2022 held in Alpharetta, US, increased activity and publications on the YouTube channel @creatineforhealth (first half of 2023), and an advertising strategy launched in early 2024 to boost the channel's reach, resulting in videos surpassing one million views. Regarding Twitter/X data from 2007 to 2021, a total of 657,039 tweets revealed no significant differences in average sentiment, indicating a neutral overall perception of creatine. However, the data showed a higher prevalence of strong negative sentiment (2.09%) compared to strong positive sentiment (0.69%). The word mining analysis revealed statistically significant associations ($p<0.001$) between the term "monohydrate" and words such as "creatine," "micronized," "Creapure," "better," "cheapest," and "effective," as well as with "bloating," "stomach," and "issue." For "HCl," significant associations were found with words like "stomach," "better," "bloating," "superior," "expensive," "cost," and "soluble."

**KEYWORDS**
Creatine; dietary supplements; social media; sentiment analysis; machine learning; scientometrics

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**Conclusion:** While sentiment analysis suggests that a small percentage of the public holds a stronger negative view of creatine supplementation, it remains unclear how misinformation may have influenced these perceptions. These data objectively support the positive impact of bridging the gap between high-level researchers and the general population through social media (e.g., 'Creatine for Health') as well as highlight the potential of information systems like CREAS to routinely inform, develop, improve, and support research endeavors and clinical practice. Further efforts are still needed to educate the public and combat *scienciness* or the bandwagon effect.
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