

Real-World Evidence on Social Media Provides Insights Into Patient Mental Health Outcomes in the Management of Gout

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BACKGROUND

Gout, a common form of inflammatory arthritis, is characterized by acute, painful flares, tophi, and reduction in patients' quality of life¹.

Both emotional and physical stress are linked to gout². Recent work has highlighted associations between gout, depression, and anxiety³. Yet, the circumstances behind these associations are not fully understood.

The goal of the current study was to explore how different approaches to disease management impact emotional and mental health in gout.

METHODS

An artificial intelligence (AI) platform leveraged a variety of natural language processing techniques to identify prevalent terms, concepts, and topics across social media groups discussing gout. Here, we utilized the platform's ability to tag statements related to 'disease management' and 'mental health'.

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1 THE DATA SOURCE

Data included two social media sources: a private Facebook group (The Gout Support Group of America) and a public subreddit (r/gout). This figure shows combined totals.

>9,500 USERS Included
8,771 POSTS Shared
114,343 COMMENTS Elicited

NOVEMBER 2011- MARCH 2022
 DATE RANGE

3 MANAGEMENT STATEMENTS

The AI platform identified about 25% of all statements as relating to disease management (i.e., a probability score >.98). These statements were targeted for all further analyses.

Category	Percentage
Management	25%
Other	75%

5 EMOTION CONTRASTS BY MANAGEMENT TYPE

To further understand differences in conversations between management types, we compared emotional affect of words in each group. Results showed significant differences in affect counts by group ($\chi^2=95.9$, $df=7$, $p<.001$).

Proactive care statements included more words weighted on 'trust' while reactive care statements included more 'fear' and 'sadness' weighted words. *** indicates $p<.001$ with Bonferroni Correction.

Emotion	Proactive (%)	Reactive (%)
Anger	~8%	~11%
Anticipation	~17%	~14%
Disgust	~7%	~7%
Fear	~13%	~20%
Joy	~10%	~6%
Sadness	~10%	~16%
Surprise	~8%	~10%
Trust	~27%	~15%

2 MENTAL HEALTH DOMAINS

The AI platform identified conversations with a high probability score (>.90) for discussing mental health (about 4% of all statements). Terms related to stress, depression, and anxiety were the most frequent.

Domain	Percentage
Stress	37%
Depression	22%
Anxiety	17%
Other	24%

4 PROACTIVE VS. REACTIVE CARE STATEMENTS

Statements related to proactive care (e.g., 'primary care', 'pcp') and reactive care (e.g., 'urgent care', 'walk-in clinic') were isolated. Proactive care statements (N=654) had a significantly higher proportion of positive vs. negative words compared to reactive care statements (N=520) ($\chi^2 = 33.0$, $df=1$, $p<.001$).

Management Type	Positive (%)	Negative (%)
Proactive Care	56%	44%
Reactive Care	41%	59%

6 MEDICATION CONTRASTS BY MANAGEMENT TYPE

A final analysis compared frequencies of the 5 most prevalent medications in the source data.

Significant differences were found between groups ($\chi^2=73.3$, $df=4$, $p<.001$) where proactive care statements mentioned Allopurinol most vs. Steroids in reactive care statements. *** indicates $p<.001$ with Bonferroni Correction.

Medication	Proactive (%)	Reactive (%)
Steroids	~28%	~52%
Colchicine	~21%	~20%
Indomethacin	~4%	~11%
Other NSAIDs	~10%	~10%
Allopurinol	~36%	~5%

CONCLUSIONS

We contrasted emotional and mental health impacts between proactive and reactive care statements on social media.

Overall, proactive care statements were more positive and included more language weighted on 'trust'. Reactive care statements were weighted most on 'fear' and 'sadness' and included more mentions of short-term medication interventions (e.g., steroids).

This work highlights how different approaches to gout management are associated with varying levels of emotional-well being.

This analysis increases our understanding of the impact of gout on patients' lives and highlights the richness of the conversations shared among community members on social media.

FUTURE WORK

Future work ought to explore how to encourage and educate patients on long-term proactive management of gout. In turn, this could mitigate reliance on short-term interventions associated with painful flares and negative mental and emotional impacts.

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