



Abstract

# Social Network and Sentiment Analysis of the #Nutrition Discourse on Twitter<sup>†</sup>

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**Abstract:** Social media platforms allow people to share information, connect, and build networks at an unprecedented scale with positive and negative consequences. Social network analysis (SNA) applies mathematical network and graph theory to visualise information transfer as relational networks of connected nodes. Measuring node connectivity (centrality) permits the identification of ‘influencers’. SNA has been applied to analyse the spread of misinformation on Twitter (1), but to date, no research has examined nutrition networks. Therefore, this study examined the #Nutrition conversations on Twitter utilising SNA and linguistic analyses. English language tweets including ‘#Nutrition’ on 1–21 March 2023 were collected using the SNA tool, NodeXL Pro (Network Overview for Discovery and Exploration in Excel) (2). SNA is a multistep process that calculates graph metrics and develops a network graph to measure the relationships between users. SNA also identifies semantically related words, hashtags, and word pairs and identifies the sentiment of words used, as measured against the Opinion Lexicon (2). The #Nutrition network included 17,129 vertices (users) with 26,809 unique edges (connections); edges with duplicates were merged. The network density was low, suggesting that most users communicate heavily with a small number of users. The average geodesic distance between any two users was 5.26, revealing a dispersed online discussion. SNA identified the top 10 influencers in this network, measured by high betweenness centrality (23,375,543–5,207,998). Influential users were from a mix of accounts including personal, online blogs, and government organisations. High betweenness centrality identified the users with the greatest influence, acting as bridges between network groups and therefore amplifying #Nutrition messages. Sentiment analysis found the discourse was more positive (0.047, 22,218 words) than negative (0.015, 6795 words). Semantic analysis calculated the total words, 468,191, and identified the most frequently used words in the tweets: #nutrition, #health, food, more, nutrition, health, #diet, #healthylifestyle, #fitness, and #food. Social network analysis shows the discourse on Twitter relating to #Nutrition is dispersed without clear polarising views. Semantic analysis showed that ‘health’ was the main topic discussed in relation to nutrition in this network and was most frequently associated with #Nutrition. The narrative was positively framed, as identified through sentiment analysis.

**Keywords:** Twitter; social network analysis; networks; semantic analysis



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