Public Perception on GLP1 receptor agonists : Leveraging Sentiment Analysis and BERTopic Modeling on Twitter Data

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or obese. The findings emphasise the significant role of psychological states in influencing physical safety and well-being, underlining the need for targeted interventions.

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Public Perception on GLP1 receptor agonists: Leveraging Sentiment Analysis and BERTopic Modeling on Twitter Data

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Introduction: Obesity is a growing global concern, associated with increased morbidity, mortality and negatively impacting quality of life. Pharmacotherapy to help achieve body weight normalization has been an important field of research to try to curb the obesity pandemic. GLP-1 receptor agonists (GLP1-RA) have emerged as a promising solution. There is increasing evidence of their effectiveness. This has contributed to a massive increase in demand for these drugs that led to a global shortage. However, there are also growing concerns regarding GLP1-RA safety, cost, equity, and availability. With the advent of social media, individuals frequently turn to platforms like X (previously: Twitter) to express their views and share experiences regarding health issues, including anti-obesity drugs. Understanding public sentiment and the topics of discussion can provide valuable insights for healthcare providers, policymakers, and pharmaceutical companies. This study seeks to analyze sentiment and topic modeling within X (Twitter) discussions about GLP-1 RA, capturing the public's perception and the prevailing discourse.
Methods: Our analysis covers a dataset of 8,953 tweets collected from December 15th, 2023 to January 10th 2024, with a focus on the main GLP1 RA on the market (liraglutide, semaglutide, and dulaglutide).
Data collection utilized the Python library Tweepy and the Twitter API, with a pre-tested query to capture discussions around GLP1 RA.
We applied roberta-xlm twitter, a transformer-based language model, for sentiment analysis, categorizing the tweets into positive, negative, and neutral sentiments. BERTopic, an algorithm for deriving thematic structures from extensive textual data, was employed for topic modeling.
Results: Sentiment analysis showed a higher prevalence of negative (44.5%) and neutral (44.6%) sentiments compared to positive ones (10.9%), indicating mixed public reactions. Topic modelling revealed ten major themes which included the effectiveness of GLP1 RA, concerning side effects including hair loss and suicidal thoughts, and severe adverse reactions like coma associated with counterfeit medication use. Other identified themes encompassed cuts in government healthcare funding, personal narratives of drug use, and viewpoints from within the pharmaceutical industry. The use of word clouds offered a visual interpretation of the key terms tied to these themes, with 'Ozempic' emerging as the most frequently mentioned medication. Sentiment analysis depicted a diverse array of opinions: while some tweets praised these medications as groundbreaking, others criticized them with negative descriptors such as 'fake,' 'craze,' 'cosmetic,' and 'scam.'
Conclusion: The analysis highlights the complexity of public opinion on anti-obesity medications. While there is a significant amount of scepticism and neutral stances, positive sentiments reflect successful personal outcomes and support for these medications. These insights can guide healthcare providers and pharmaceutical companies in addressing public concerns and improving communication strategies regarding treatment options for obesity.

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Explore ChatGPT's Effectiveness in the Medical Realm: An In-depth Study in the Field of Obesity Medicine

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Introduction: ChatGPT, an advanced language model, has numerous potential applications in the medical field. It can enhance clinical documentation by swiftly extracting crucial information and generating notes, saving time and improving accuracy. However, the domain knowledge of ChatGPT has not been thoroughly validated. Therefore, we conduct a performance evaluation in the field of obesity.
Methods: ChatGPT is evaluated with different types of questions, including definitions, explanations of body composition and lab data, treatment suggestions, and detection of pitfalls and dangerous signs. The answers provided by ChatGPT are reviewed and scored by two expert medical doctors on a scale of 0 to 5. Statistical software is used to analyze the results quantitatively and qualitatively.
Results: ChatGPT scores high in questions of general definition. However, it struggles with the local definition of obesity and overweight in Taiwan, often providing either the American definition or an incorrect threshold.
ChatGPT performs well in explaining single abnormality in lab and body composition reports. However, it struggles when facing with multiple abnormalities, providing confusing explanations by addressing each parameter individually without considering them as a whole. The model also lacks the ability to identify potential incorrect lab data, resulting in poorly scoring in this section.
ChatGPT consistently recommends diet controlling and behavior changing as the primary approach for initial treatment and subsequent suggestions for patients with obesity. It also suggests disease controlling for patients with comorbidities like diabetes. However, when asking about medication usage and dosage adjustments during follow-up, ChatGPT acknowledges its limitations as an AI model without the ability to prescribe medicine. As a result, relevant answers are lacking.
The limitations of ChatGPT are apparent in both pitfalls and dangerous sign detection testing. In a simple scenario involving a patient under GLP-1 treatment who experiences epigastric pain, rebounding pain, and increasing amylase level, ChatGPT is able to warn about the possibility of acute pancreatitis. However, in real-world clinical situations often occur with multiple symptoms and illnesses, ChatGPT often addresses each symptom-disease pair separately without considering the bigger picture. As a result, ChatGPT receives worse scores for complex situations than simple symptoms.
Conclusion: ChatGPT holds potential in improving various aspects of the medical field, including clinical documentation, patient assistance, medical education, and drug discovery. However, the evaluations in the field of obesity reveal some limitations. While ChatGPT performs well in general definition questions and explaining single abnormality in lab data, it struggles with local definitions, interpreting multiple abnormalities, and recognizing incorrect lab results. Additionally, its responses regarding medication usage and dosage adjustments are limited, and it has difficulty comprehensively addressing complex symptoms presentations.