## Social media research to understand reported efficacy of GLP-1 RAs for weight loss in obesity

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### **Introduction & Objective**

- · Obesity represents a significant global challenge and is associated with increased incidence of multiple co-morbidities including type 2 diabetes, cancer, and cardiovascular diseases.<sup>1</sup> Its prevalence has nearly tripled since 1975; in 2016, 13% of the world's adult population were obese, while over 340 million children and adolescents worldwide were overweight or obese.<sup>2</sup>
- Glucagon-like peptide-1 receptor agonists (GLP-1 RAs), originally licensed for the • treatment of diabetes, have in recent years become widely used in obesity due to their delaying of gastric emptying and associated reduction in food intake.<sup>3</sup>
- Advances in natural language processing technologies and large language models allow for efficient processing and categorization of social media data, which can be used for comprehensive qualitative analysis known as 'social listening'. This can provide a rich, uncensored view of individual patient perspectives not typically available in the published literature.<sup>4-6</sup>
- This study aimed to analyse social media data to explore patient-reported efficacy • of treatment with GLP-1 RAs for weight loss in obesity.

## **Results**

• As shown in Figure 1, a total of 7,783 posts that mentioned the use of GLP-1 RAs for weight loss were identified from social media and online sources. These posts were shared by 5,879 individuals, of which 809 individuals discussed effectiveness of GLP-1 RAs for weight loss. A random sample of 361 individuals from those discussing effectiveness of GLP-1 RAs was considered for detailed qualitative analysis to understand how effectiveness of GLP-1 RAs was evaluated for weight loss.

### **Methodology**

- Publicly available social media entries about GLP-1 RAs posted on Twitter, Reddit, patient forums and blogs between June 2022 to May 2023 were identified using a natural language processing (NLP)-based social media listening tool.
- These posts were filtered and contextualized for use of GLP-1 RA treatment for weight loss in obesity. Comments mentioning use of these treatments exclusively for diabetes or insulin resistance were excluded.
- The posts were categorized further to identify those potentially being shared by obese/overweight patients. A subset of these posts was considered for detailed qualitative analysis using random sampling.
- Qualitative content analysis of the selected posts was conducted by life sciences-qualified analysts to understand patient perspectives on effectiveness of GLP-1 RAs for weight loss.

### Figure 1: Data Contextualization and Sampling





- Of the 361 individuals who discussed effectiveness of GLP-1 RAs for weight loss, 81% (n=293) reported that these drugs were effective; the remaining 19% reported that they were ineffective.
- Individuals who reported benefits from using GLP-1 RAs for weight loss evaluated their effectiveness not only in terms of weight reduction (n=257, 88%).
- As shown in Figure 2, a total of 240 individuals (82%) reported experiencing • psychological benefits when using GLP-1 RAs for weight loss. Reported psychological benefits of GLP-1 RAs for weight loss included reduced cravings and binging (n=119, 50%), reduced thoughts about food, referred to as "food noise", (n=68, 28%), and suppressed appetite (n=53, 22%). When discussing the psychological benefits, individuals used phrases such as "food noise has disappeared", "cravings are almost gone", and "I don't feel hungry" (Figure 3).
- A total of 270 individuals (74.8%) reported that they experienced side effects while taking GLP-1 RA treatments for weight loss. As shown in Figure 4, nausea (n= 146, 54%) was the most reported side effect, followed by other GI issues such as diarrhea (n=62, 22.9%), constipation (n=57, 21%), gas (n= 45, 17%), vomiting (n=31, 11%) and stomach pain (n= 23, 8.5%). However, only 8% of individuals reported discontinuing treatment or titrating treatment dose due to the side effects, indicating that the larger patient pool valued the effectiveness of GLP-1 RAs for weight loss over the inconvenience of the GI side effects experienced.
- Experiences related to the administration of GLP-1 RAs for weight loss were reported by 270 individuals. Of these, 62% did not express any sentiment towards subcutaneous injections being the mode of administration. Some 24% (n=64) of individuals had a positive perception about injecting themselves; this was prominently driven by manageable pain (n=20, 31%), ease of use of injectors (n=18, 28%), injection site flexibility (n=14, 21%), minimal injection site reactions (11%) and only once-a-week dosage frequency (8%) for treatments such as semaglutide and tirzepatide.

# Conclusions

- Writers of social media posts/blogs expressed positive sentiments regarding the efficacy of GLP-1 RAs for weight loss in obesity, reporting psychological benefits.
- While GI side effects of GLP-1 RAs were discussed, the number of patients discussing the effectiveness of these treatments in aiding weight loss seemed to far exceed the number of patients discontinuing treatment or titrating the dose due to side effects.
- The majority of individuals did not express any sentiment towards self-injecting **GLP-1 RAs.**



Number of individuals randomly sampled for detailed qualitative content analysis to understand perspective on effectiveness of GLP-1 RAs for weight loss



#### Figure 2: Patient-reported Factors for Evaluating Effectiveness of **GLP1-RAs in Obesity**

### Figure 3: Word Cloud of Psychological Benefits of GLP-1 RAs for Weight Loss



### Figure 4: Patient-reported Side Effects of GLP-1 RAs for Weight Loss



individuals

- Social listening highlighted additional benefits of GLP-1 RA treatment for weight loss, such as appetite suppression and reduced cravings and food noise, in addition to their efficacy in reducing body weight.
- Qualitative and quantitative analysis of patient-reported social media posts can be a significant source of patient-reported outcomes of GLP-1 RA treatments for weight loss.



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