

# Implications of Ozempic: A Semaglutide with Peptide (GLP)-1 Receptor Agonists Misused for Cosmetic Weight Loss

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## ABSTRACT

Ozempic, classified as a GLP-1 receptor agonist, is a semaglutide primarily prescribed for managing type 2 diabetes. It operates by mimicking the hormone glucagon-like peptide-1 (GLP-1), thereby prompting insulin secretion and reducing glucagon levels. Administered via weekly injections, it aids in regulating blood sugar levels by enhancing insulin production from the pancreas. Originally designed to assist diabetics in controlling their blood sugar, it was later discovered to be effective in promoting weight loss as well (National Library of Medicine, n.d.). However, individuals using Ozempic for weight loss may face elevated risks of experiencing gastrointestinal issues. This conclusion stems from comprehensive research analyzing insurance claims spanning from 2006 to 2020, involving over 5,000 patients across the United States. The findings highlighted a range of health complications, including biliary disease, gastroparesis, pancreatitis, and bowel obstructions among those using Ozempic for weight loss. Notably, collected data has revealed a significant demand for Ozempic for weight loss, with 22% of Americans seeking prescriptions from their physicians and 15% having personally used it for weight management (Arillotta et al., n.d.). Additionally, 47% of respondents reported knowing someone who had used Ozempic for similar purposes. These statistics underscore the imperative for healthcare providers to educate patients regarding appropriate medication use and associated risks. Moreover, the study underscores the necessity for further research initiatives and public awareness campaigns to address the hazards associated with the misuse of pharmaceuticals for off-label purposes for cosmetic usage (Chiappini et al., 2023).

## INTRODUCTION

Ozempic is a semaglutide in the drug class: GLP-1 receptor agonists; used to treat type two diabetes. This injection works by mimicking the hormone glucagon-like peptide-1 (GLP-1), this stimulates insulin secretion reducing the amount of glucagon present (National Library of Medicine, n.d.). The injection is administered once a week and can help regulate blood sugar and improve blood sugar control by helping the pancreas produce more insulin. This drug was originally developed to aid type two diabetics with their blood sugar, but later found to be effective towards weight loss. Rapidly gaining popularity for their effects on weight and is ubiquitous on social media, this is being promoted by celebrities across all demographics.

Individuals who take Ozempic for weight loss may be at an increased risk of various health factors including gastrointestinal problems. The results mainstreamed the concept, highlighting the morphological results that will occur with the use of this medication. Research based on insurance claims from 2006 to 2020 for over 5,000 patients in the United States has led to biliary disease, gastroparesis, pancreatitis or bowel obstructions after being prescribed Ozempic for weight loss (National Library of Medicine, n.d.). The condition causes severe abdominal pain, and could require hospitalization or surgery.

Gastroparesis is being seen at a rate of 10 cases per 1,000 semaglutide users, causing a significant impact on the quality of life. The medication's widespread popularity means that if 1 million people are prescribed, hundreds of thousands of people can experience obstructions and gastrointestinal disturbances.

According to recent data, semaglutide injection (Ozempic, Wegovy) is being increasingly prescribed to manage weight loss and diabetes. While it is prescribed to help control blood sugar levels in type 2 diabetes, recent studies indicate concerns surrounding its side effects, particularly the risk of thyroid tumors like medullary thyroid carcinoma (MTC). A notable warning from the FDA highlights that laboratory animals administered semaglutide developed thyroid tumors, though the risk in humans remains unknown. Consequently, individuals with a history of MTC or Multiple Endocrine Neoplasia type 2 (MEN 2) are advised against using this medication. Despite its weight loss benefits, the drug can cause serious side effects such as nausea, vomiting, and gastrointestinal issues. Medical professionals have expressed concern about the medication's increased misuse for weight loss, with 52% of Americans who use semaglutide stating it has become more challenging to find their prescribed medication. As a result, experts are urging patients to carefully consider the risks, such as potential thyroid issues and other severe side effects, before using semaglutide (National Library of Medicine, n.d.).

Using too much Ozempic or taking the medication too frequently can lead to an overdose and increase the risk of harmful side effects of dangerously low blood sugar or hypoglycemia. Body Mass Index (BMI) can screen potential health problems and provide insights into overall health; however, it is not an accurate indication of what is healthy and what is not. Ozempic works by slowing down how quickly food passes through the stomach, leading people to feel fuller for a long period of time. Individuals who are taking this injection can become obsessed with their body image and display factors of FNAE (Fear of Negative Appearance Evaluation), leading to an addiction to Ozempic (Chiappini et al., 2023). Doing weekly injections when not having type two diabetes can lead to a disruption of homeostasis. The human body will go into a state of deprivation with the combination of unneeded medication and a decrease in caloric intake. Leading to the body starting to use stored energy such as fat and damage to vital organ systems to prioritize essential functions and to sustain proper homeostasis. Overall, affecting one's BMI which is caused by nutritional deficiencies and can lead to compromised immune function (Dunican & Desilets, 2017).

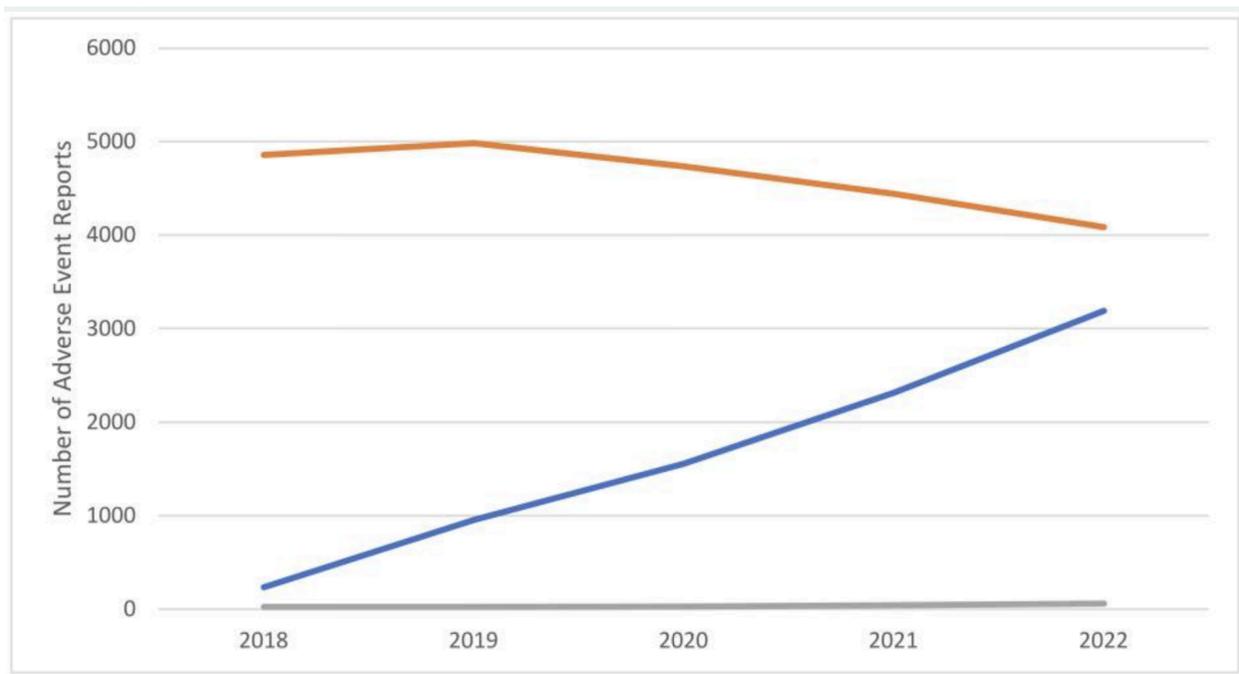
This illuminates the concerning trend of using Ozempic, a medication primarily indicated for managing type two diabetes, as a means of weight loss among individuals without the condition. These findings underscore the importance of health care providers' vigilance in educating patients about the appropriate use of medications and the potential risks associated. This study emphasizes the need for further research and public awareness campaigns to address the dangers of misusing pharmaceuticals for non-approved purposes (Arillotta et al., n.d.).

### **INSIGHTS FROM INSURANCE CLAIM ANALYSIS**

The study examines the potential issues and abuse of semaglutide, a medication used in treatment of type 2 diabetes; in comparison with other GLP-1 analogues and the phentermine-topiramate combination. Analyzing the pharmacovigilance data from FAERS, the FDA's Adverse Event Reporting System, the study reveals a concerning trend of increasing adverse event reports (AERs) associated with semaglutide

(Ozempic) from 2018 to 2022, involving major gastrointestinal issues (Arillotta et al., n.d.). Unlike the stable AERs for the phentermine-topiramate combination, semaglutide exhibited higher levels of abuse, intentional product use issues, and use without a proper prescription and diagnosis needed. This major off-label usage and potential misuse may stem from its efficiency in weight loss, prompting comparison with drugs misused for similar purposes. Individuals have taken advantage of semaglutide such as Ozempic that show profound results in weight loss, however it is promoting an extreme misuse of the medication for cosmetic weight loss. Additionally, this study explores the neurobiological implication of GLP-1 analogues on the system, suggesting a link between semaglutide withdrawal symptoms and its effects on appetite regulation. While acknowledging limitations in pharmacovigilance data interpretation, the study underscores the need for monitoring and awareness among clinicians regarding the potential misuse of semaglutide and other GLP-1 analogues such as Ozempic. Offering insights into their effects on weight loss and neurological functions (Smeets, de Wit, Verhoeven, & van der Werf, 2023).

**Image 1: Comparison of Adverse Event Reports for Selected GLP-1 Receptor Agonists in FAERS (2018-2022)**



*Image 1: Stefania Chiappini. Is There A Risk For Semaglutide Misuse? 2023. PubMed (Chiappini et al., 2023)*

In the figure, the **blue line** represents the number of adverse event reports (AERs) associated with **semaglutide**, while the **orange line** represents the AERs related to **other GLP-1 analogues** (such as dulaglutide, liraglutide, exenatide, lixisenatide, tirzepatide, and albiglutide).

**Image 2: Comparison of Adverse Event Reports for Semaglutide, Phentermine-Topiramate, and Other GLP-1 Analogues in FAERS (2018-2022)**

Semaglutide		Phentermine–Topiramate		Other GLP-1 Analogues *	
Preferred Term	# AER (%)	Preferred Term	# AER (%)	Preferred Term	# AER (%)
Nausea	1047 (13%)	Nephrolithiasis	14 (8%)	Nausea	1843 (8%)
Vomiting	921 (11%)	Headache	11 (6%)	Blood glucose increased	1604 (7%)
Diarrhea	699 (8%)	Weight increased	10 (5%)	Vomiting	1586 (7%)
Pancreatitis	492 (6%)	Angle closure glaucoma	9 (5%)	Pancreatitis	1459 (6%)
Off-label use	483 (6%)	Blurred vision	9 (5%)	Diarrhea	1426 (6%)
Weight decreased	465 (6%)	Suicidal ideation	8 (4%)	Acute kidney injury	1112 (5%)
Blood glucose increased	424 (5%)	Chronic kidney disease	7 (4%)	Weight decrease	1082 (5%)
Decreased appetite	387 (5%)	Hypoesthesia	7 (4%)	Fatigue	794 (3%)
Fatigue	357 (4%)	Breast cancer	6 (3%)	Decreased appetite	711 (3%)
Dehydration	352 (4%)	Paresthesia	6 (3%)	Chronic kidney disease	689 (3%)

Image 2: Stefania Chiappini. *Is There A Risk For Semaglutide Misuse? 2023. PubMed* (Chiappini et al., 2023)

### Image 3: Comparison of Adverse Event Reports for Semaglutide, Ozempic , and Other GLP-1 Analogues in FAERS (2018–2022)

Semaglutide		Phentermine–Topiramate		Other GLP-1 Analogues *	
Outcome	# AER (%)	Outcome	# AER (%)	Outcome	# AER (%)
Other outcomes	5418 (66%)	Other outcomes	154 (84%)	Other outcomes	14,206 (61%)
Hospitalized	3479 (42%)	Hospitalized	46 (25%)	Hospitalized	10,287 (45%)
Life threatening	306 (4%)	Disabled	14 (8%)	<b>Died</b>	<b>1705 (7%)</b>
Disabled	299 (4%)	Life threatening	3 (2%)	Life threatening	1103 (5%)
<b>Died</b>	<b>273 (3%)</b>	<b>Died</b>	<b>1 (1%)</b>	Disabled	671 (3%)
Required intervention	67 (1%)	Required intervention	1 (1%)	Required intervention	76 (<1%)

Image 3: Stefania Chiappini. *Is There A Risk For Semaglutide Misuse? 2023. PubMed* (Chiappini et al., 2023)

Furthermore, with the graph illustrating the potential misuse of Ozempic and Semaglutide, analyzing the data from FAERS, the FDA’s Adverse Event Reporting System, semaglutide is shown to be associated with these fatalities listed. This study examines the potential misuse and abuse of semaglutide, the key finding include the following:

**Increase in AERs for Semaglutide:** A steady increase in AERs related to semaglutide was observed from 2018 to 2022, while AERs for the remaining GLP-1 analogues decreased during the same period. AERs for the phentermine-topiramate combination remained stable.

**Most Common AERs:** AERs for semaglutide and other GLP-1 analogues mainly involved gastrointestinal adverse events. Conversely, AERs for the phentermine-topiramate combination were more often associated with dizziness, headache, and other neurological symptoms.

**Off-label Use and Misuse Potential:** Semaglutide showed higher levels of misuse, abuse, intentional product use issues, and use without a prescription compared to other GLP-1 analogues. Off-label prescription of semaglutide was identified as a concern, potentially contributing to its misuse potential.

**Semaglutide as an Image- and Performance-Enhancing Drug (IPED):** The study suggests that semaglutide may be misused as a weight-loss agent, similar to other drugs used for image and performance enhancement. Its potential misuse is attributed to its significant weight loss effects (Arillotta et al., n.d.).

**Neurobiological Effects and Reward System:** Semaglutide's effects on the reward system and potential withdrawal symptoms are discussed, suggesting a possible link between its use and craving phenomena.

**Potential Therapeutic Use in Neurology:** GLP-1 analogues, including semaglutide, show potential therapeutic benefits in neurodegenerative diseases like Parkinson's disease and Alzheimer's disease, possibly through their effects on dopaminergic function and neuroinflammation.

Limitations of the study include the inability to differentiate types or reason for abuse/misuse and potential confounding factors such as comorbidities and concomitant medications. Overall, the study highlights the importance of monitoring and addressing the misuse potential of semaglutide and other GLP-1 analogues in clinical practice (Chiappini et al., 2023).

## OZEMPIC IN THE UNITED STATES

Ozempic (semaglutide) has become a major point of discussion, not only for its weight loss benefits but also due to gastrointestinal side effects that have sparked considerable attention. The drug has generated a significant amount of interest across various U.S. regions, with certain states and cities experiencing higher demand, reflecting broader health trends and concerns.

The study surveyed over 1,000 Americans, including medical practitioners, about their use and perceptions of Ozempic for weight loss. Key findings include:

- 15% of surveyed Americans have personally used Ozempic for weight loss, while 47% know someone who has.
- 70% of respondents say they cannot afford Ozempic for weight loss.
- Nearly a quarter of Americans have asked their doctor for an Ozempic prescription for weight loss, with social media influencing some requests.
- Southern states, particularly Miami and Atlanta, have shown the highest online search volume for Ozempic.

The data progresses into the multifaceted impact of Ozempic's popularity in America. By surveying over 1,000 Americans, including medical practitioners, the study sheds light on various aspects:

- **Personal Usage and Awareness:** The data collected reveals that 15% of surveyed Americans have personally used Ozempic for weight loss, while a staggering 47% know someone who has (National Library of Medicine, n.d.). This highlights the widespread awareness and adoption of Ozempic for its weight loss benefits.
- **Financial Accessibility:** Despite the desire to utilize Ozempic for weight loss, financial constraints pose a significant barrier for many individuals, with 70% of respondents stating they cannot afford the medication (Singh, Krauthamer, & Bjerke, 2016). This underscores the socioeconomic implications of accessing innovative pharmaceutical treatments.
- **Physician-Patient Dynamics:** Approximately a quarter of surveyed Americans have requested an Ozempic prescription from their healthcare providers for weight loss purposes. While social media serves as a catalyst for some individuals' interest in Ozempic, a substantial portion (41%) attribute their request to a doctor's recommendation. This highlights the pivotal role of healthcare professionals in shaping patient treatment decisions (Smeets, de Wit, Verhoeven, & van der Werf, 2023).
- **Regional Disparities:** The study identifies geographical disparities in Ozempic's demand, with Southern states exhibiting the highest online search volume for the medication. Cities like Miami and Atlanta emerge as hotspots for Ozempic inquiries, indicating regional variations in medication utilization patterns.

In addition to capturing patient perspectives, insights from medical practitioners, elucidating their viewpoints on Ozempic's sudden popularity and clinical implications:

- **Prescribing Practices:** While 58% of medical practitioners express willingness to recommend Ozempic for weight loss, concerns regarding potential misuse and patient eligibility are prevalent. Notably, 36% of practitioners report facing backlash when refusing to prescribe Ozempic, underscoring the complex dynamics surrounding patient-provider interactions (Chiappini et al., 2023).
- **Side Effects and Insurance Coverage:** Nausea, headache, and diarrhea are identified as common side effects of Ozempic, prompting considerations for patient tolerability and management. Furthermore, opinions diverge regarding health insurance coverage for Ozempic, with 49% of medical practitioners advocating for coverage and 51% opposing it (Chiappini et al., 2023).
- **Alternative Medications and Market Trends:** Amidst Ozempic's surge in popularity, alternative medications such as Wegovy and Mounjaro have also experienced heightened demand, particularly in Southern states. This trend underscores broader shifts in pharmaceutical market dynamics and consumer preferences (Smeets, de Wit, Verhoeven, & van der Werf, 2023).

In summary, this study offers a detailed exploration of Ozempic's impact in the U.S., emphasizing patient behaviors, healthcare provider perspectives, and regional variations in medication use. It highlights significant trends in the demand for weight loss medications, the barriers to access, and the clinical implications that emerge as the medication continues to gain traction. The findings underscore the

complexities of balancing the promise of pharmaceutical innovations with the challenges of affordability, patient education, and medical practice.

By examining these various facets, the study provides a nuanced understanding of how a rapidly emerging treatment like Ozempic is shaping both the healthcare landscape and public perceptions in America.

## CONCLUSION

In conclusion, the findings from the all studies and the insights gleaned from various sources shed light on the multifaceted implications of Ozempic's surge in popularity in America. Originally designed as a treatment for type 2 diabetes, Ozempic's unexpected weight loss side effect has catapulted it into the spotlight, prompting widespread demand and shortages, particularly in Southern states (Dunican & Desilets, 2017). This trend underscores the complex interplay between pharmaceutical innovation, consumer behavior, and healthcare delivery dynamics.

The study revealed a significant proportion of Americans seeking Ozempic prescriptions for weight loss, driven by social media influence and physician recommendations. However, financial barriers and regional disparities pose significant challenges to accessing this medication, highlighting the need for improved affordability and equitable distribution.

Moreover, insights from medical practitioners underscored concerns regarding potential misuse, side effects, and insurance coverage issues associated with Ozempic. Alternative medications like Wegovy and Mounjaro have also experienced heightened demand, reflecting shifting market trends and consumer preferences.

Overall, all the studies have emphasized the importance of informed decision-making, patient education, and healthcare provider vigilance in navigating the complexities surrounding medication use, particularly for off-label purposes such as weight loss (Singh, Krauthamer, & Bjerke, 2016). Addressing these challenges requires collaborative efforts from stakeholders across the healthcare ecosystem, including policymakers, pharmaceutical companies, healthcare providers, and patient advocacy groups (National Library of Medicine, n.d.).

Moving forward, further research initiatives and public awareness campaigns are warranted to mitigate the risks associated with the misuse of pharmaceuticals for non-approved purposes and ensure equitable access to innovative treatments like Ozempic. By fostering a holistic understanding of the implications of medication utilization, we can strive towards enhancing patient outcomes and promoting health equity in our communities.

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