

Maralyn Anderson.

Student number: 2210083.

GLP-1 Receptor Agonist: A Breakthrough in Medical Science or a Safety Concern to the public.

Introduction

Obesity rates have reached pandemic levels globally (Ahmed, 2025). In 2022 Lancet studies have indicated that over a billion individuals are obese, with 890 million adults and alarmingly 159 million children and adolescents are living with obesity (Islam, 2024; Derraik, 2025). And three billion are in the overweight category making up 38% either living with obesity or overweight (Koliaki *et al*, 2023). Thus, creating a significant health burden and leading to a range of incurable diseases, such as heart disease, and cancer. Thus, resulting in mortality and a significant impact towards quality of life (Ng, 2024). It is estimated that over 2.8 million die each year as a result of obesity related illnesses (Ahmed, 2023). Obesity rates have more than doubled over the past 30 years (GBD, 2021) and are rapidly increasing in all ages globally (Koliaki, 2023). It is predicted that in 2050 that over 50% of the global population will be living with obesity or being overweight leading into pandemic repercussions (GBD, 2021).

Throughout the years there have been pharmacological drug treatments to tackle weight loss with poor success rates the results gave poor expectations from both health care professionals and patient thus, making them short-lived (Coutinho, 2024). With the small percentage of weight loss there was a combination of side effects that contribute to the lack of tolerability within patients (Coutinho, 2024). With major side effects, safety issues, and low efficacy to the medication, resulting in all ending up being discontinued (Alqatari, 2025).

For many years Bariatric surgery has been considered to be the most effective solution for weight loss (Alqatari *et al*, 2025). However, Bariatric surgery can come with health risks along with lengthy waiting times (Gulinac, 2023; Aggarwal, 2024). With limited NHS trust hospitals that offer this treatment, it can drive patients to explore different options and consider paying for the procedure abroad as costs are low compared to private hospitals (Aggarwal, 2024). However, this comes with its own health risks to the patient (Aggarwal, 2024).

This essay critically evaluates the effectiveness and implications of GLP-1 receptor agonists for weight management, primarily focusing on health outcomes, nutrition, and impact on mental health.

Action and Clinical Effectiveness

Scientists have been searching for a solution for an insulin stimulation, from 1902 right through to 1980 the first discovery was founded of the hormone's secretion GLP-1 peptide in the intestine, it had shown its powerful ability to stimulate insulin release dependently (Drucker, 2024). However, it was not until 2005 the FDA approved GLP-1 as a treatment for type 2 diabetes (Nauck, 2021). In 2014 the FDA approved the first GLP-1 for weight loss (Darwish, 2025). Making liraglutide specifically designed to fight chronic weight management in non-diabetic patients (Darwish, 2025). Since then, the developments of other GLP-1 have been released to the market in such as semaglutide (Ozempic) and Semaglutide (Wegovy) have all been approved for weight management proposes (Abu- Nejm, 2025).

Scale trails had begun in 2014 with positive results (Popoviciu, 2023). A dramatic weight loss in obesity patients using liraglutide at 3.0mg had produced a weight loss of 8.0% compared to the patients on the placebo that lost 2.6% with results of 63% of the patients using liraglutide achieving 63% of weight loss of at least 5% of body weight. This marked the first GLP-1 for weight loss, not just diabetes (Darwish, 2025). In 2016 two major studies were conducted and enrolled 9340 patients that would change the view of the medical community with results showing that the GLP-1 drug not only controlled blood sugar but had advise effects on cardiovascular disease by 26% reducing the risks of heart attacks, and strokes (Odigwe, 2025).

The physiological role of Glucagon-like-peptide (GLP-1) works by controlling the glycaemic index (Moiz, 2025). This is done by stimulating insulin release and blocking glucagon resulting in slower gastric emptying and reducing appetite this prompts fullness which decreases the "hunger hormone" ghrelin (Moiz, 2025). The GLP-1 RAs can enhance the peptide YY that is produced in the intestine and colon along with cholecystokinin which is produced in the small intestine they are both released in the gut signalling satiety this is how the delay of gastric emptying occurs (Moiz, 2025). After a meal the GLP-1 signals to the pancreas to release more insulin, this helps cells absorb glucose (Peart, 2024). The GLP-1 also inhibits the liver from releasing the stored glucose back into the blood stream thus preventing further glucose spikes with better glycaemic control (Peart, 2024). This powerful breakthrough drug has significant benefits for people living with type-2 diabetes, weight loss, and body mass index BMI it can help reducing low density lipoprotein cholesterol, triglycerides (Yao *et al*, 2024; Moiz, 2025). These medications can be administered orally or injectable (Pantea, 2024).

GLP-1's have been highly recommended as a treatment for individuals suffering with chronic weight management and obesity and has shown its effectiveness (Wojtara, 2023). However, there is limited data on long-term effectiveness on how to treat patients after treatment (Wojtara, 2023). This refers to weight management and

behavioural therapy to ensure that weight regain does not occur this can help change eating habits, thought change and understanding routines that affect eating this is done by learning and practical skills (Mozaffarian, 2025). As GLP-1's has shown its significant results in short term and long-term effectiveness, research has revealed that there is limited aftercare to help with management of weight regain this may have a negative result in long term effectiveness (Yuan, 2023). If not clinically supported by the right health care professionals, then relapse in weight gain is highly at risk and this may not be sustainable for the general population as treatment may need to be maintained for improvements in health and weight (Wilding *et al*, 2022). Consideration needs to be giving and right interventions that meets the individual's needs (Fitch, 2025). On a psychological standpoint consideration needs to be addressed in when the right support needs to be given in addressing individuals with conditions such as emotional eating, or binge eating (Radkhah, 2025). Interventions need to be considered on routine dietary counselling however; there is not enough data supporting what works best for the population without overspending and what works best for the individual needing treatment (Christensen, 2024). This means that for the general population without the right interventions and knowledge may inhibit weight fluctuations (Christensen, 2024).

Nutritional Implications of GLP-1

With the GLP-1 effects of gastric emptying and suppressing appetite can reduce calorie intake by 16-39% this can put an individual at risk of macronutrient deficiencies (Christensen, 2024). The main risk is protein deficiencies as the skeletal muscle make up around 40% of the human bodies weight (Nayland *et al*, 2024). Using GLP-1 can cause a high risk of muscle loss, and strength (Fitch, 2025). Reduced intake leads to missing key nutrients, and energy levels (Butsh, 2025). Side effects can also occur when administering GLP-1 side effects cause; nausea, vomiting, diarrhoea this can further disrupt the absorption of key nutrients the bodies needs for basic function (Ghusn, 2024). Studies have been shown that the absence of exercise in males had lost 20-25% of their skeletal muscle and 10- 15 % in females (Butsh, 2025). It is essential that adequate protein intake and resistance exercise must be included to ensure macro and micronutrients are restored (Butsh, 2025). With GI tracked issues involved such as diarrhoea, and vomiting if server enough this can cause electrolyte imbalances leading to headaches, and dizziness this is why it is essential to stay hydrated and to consume nutrient dense foods (Ghusn, 2024).

Acute side effects have been shown to disrupt the body's ability to absorb the essential key nutrients (Mozaffarian, 2025). The use of GLP-1's can inhibit other deficiency which can have an impact on the individuals over all well-being these side effects include; fatigue, hair loss, muscle weakness, and constipation (Mozaffarian, 2025). These side effects are primarily due to the lack of basic nutritional intakes like;

B12, Vitamin D, Calcium, iron, and zinc (Kerlikowsky, 2025). As well as the physical side effects this can have an impact on it can also affect mental health (Arillotta, 2023). As B vitamins are essential for energy, mood, and nerve function (Butsch, 2025). Calcium and Iron is essential for energy, bones, and overall function (Liu, 2023). Vitamin Disports bone health and immune function (Liu, 2023). And Zinc supports immune function (Jin, 2024). if disrupted this can impact the individual overall well-being and function (Jin, 2024). The importance of ensuring that the body is receiving an inadequate balance of protein, fibre, and fats is crucial to maintain health (Johnson, 2025).

Reports on the shortages, misuse, and serious health risks of using GLP-1

The world health organization states that the recommendations for GLP-1s for adults are for individuals with a BMI of 30 or higher to treat long term obesity (WHO, 2025). These drugs are specifically designed to treat medical disorders such as diabetes and obesity and are not carried out for weight loss for aesthetic or cosmetic needs (GOV.UK, 2025). However, the popularity of the GLP-1 for its dramatic weight loss results has exploded and has ended up as a high demand within the general public and industry (BBC, 2025). Dietician and health coach Susan Burry explained to the BBC of how much attention has been made on the GLP-1 drug and goes on to explain that more support and intervention should be taken into count such as behavioural modification, nutritional counselling, and exercise (BBC, 2025). The BBC reported that approximately 1.5 million people are currently using the drug in the UK. And worldwide more than one billion people (2025; BBC, 2025). The WHO has called out a warning over a shortage of the GLP-1s, with limited capacity to the injections a major barrier for the people who fit in the category for use of the drug is becoming more scars to get hold of (BBC, 2025). Reports from the NHS have stated concerns that the weekly injection will cost £122 per patient, however NICE claims it to be cost effective in terms of the cost obesity is having on the NHS (BBC, 2025). There are also risks with individuals using the injections as there are at high risks of weight gain once usage has stopped (BBC, 2025).

Repots of the misuse of GLP-1 agonists like Wegovy, Ozempic, and Mounjaro have been highlighted with significant concerns to the public health (Scragg, 2025). The UK MHRA received over 7,200 yellow card reports for treating adverse nausea, vomiting, and diarrhoea which lead to server dehydration of the use of weight loss management relating to the GLP-1 following gastrointestinal reactions this had included 68 hospitalizations and, in some cases, inappropriate use of the drug (GOV.UK, 2024). A study in Fance reported in 2025 that around 5,000 users of the drug were using GLP-1 without a diagnosis of obesity or diabetes (Soulier, 2025). US

studies found that unintentional errors and potential misuse had increased more emergency room visits and hospitalizations (Gaw, 2024). Reports on the distribution of supplying the public of fake GLP-1 have been seized by the MHRA it reports hundreds of Ozempic pens have been taken and reports that the pens can be filled with insulin filled fakes with the potential risk of hospitalities to the public (GOV. UK, 2023). While reports of the misuse is inclusive regulatory bodies and studies indicate thousands of adverse events linked to the use of off-label use and has shown the harmful misuse of counterfeited drugs being sold to the public (GOV.UK, 2024). This has prompted the government to increase the warnings and risks of inappropriate use (GOV.UK, 2024).

While many users on the GLP-1 experience mild symptoms there are some that have experienced more complex and serious adverse effects that require medical attention or permanent discontinuation (GOV, 2024). Understanding the side effects is essential for informed decision making and long-term safe use of the drug (GOV, 2024). One of the more serious risks of using GLP-1 is acute pancreatitis the regulatory bodies MHRA has received reports of significant increase in patients with acute and chronic pancreatitis linked to the use of GLP-1, including 10 deaths in the UK (O'Dowd, 2025).

GLP-1 are strongly associated with gallbladder related illness (ref). Such as gallstones (cholelithiasis) and inflammation (cholecystitis) (Ramire-Mejia, 2025). This can be cause due to the rapid weight loss that occurs while using the drug (Ramire-Mejia, 2025). This occurs by the altering of the bile composition and reducing gallbladder movement (ref). The fast metabolism can increase cholesterol in the bile leading to crystallization (Ramire-Mejia, 2025). With reduced gallbladder movement the slowing of gastric emptying can decrease gallbladder contraction, causing the bile to go stagnate studies had found that the increased risk of gallbladder or biliary related diseases were associated with the rapid weight loss (He, 2022).

While nausea and constipation are one of the less sever and common symptoms a more sever and serious complication can become detrimental in some cases. Gastroparesis or delayed stomach emptying can lead to chronic nausea, vomiting, abdominal pain (Shankar, 2024). In turn this can lead to sever dehydration, electrolyte imbalances, and malnutrition (Al-Najim, 2025). In one case repot it describes a 42-year-old woman with Barrettes esophagus had regular endoscopic procedures without any complications. However, after taking weekly semaglutide injections, the procedure changed (Shankar, 2024). After following instructions from medical staff and fasted for 18 hours before procedure the patient underwent complications and had pulmonary aspiration (Shankar, 2024). This was cause by the fact the patient has been using GLP-1 medications prior post op as known GLP-1 can delay gastric emptying there was still contents of food in the stomach this had cause

the patient to aspirate, while medical staff had no choice but to suction before endotracheal intubation (Shankar, 2024). Thus, highlighting the importance not only to the individual of the complications that can occur but also to the medical community (Shankar, 2024).

The data from the UK drugs regulator has shown a total of 82 deaths that has been related to glucagon-like peptide 1 receptor in relation to weight loss and the use for type 2 diabetes (Iacobucci, 2025). The data received from the yellow card scheme has reported adverse effects with the use of GLP-1 in January 2025 reports show that this was caused for the use of weight loss totalling in 22 deaths and 60 linked to type 2 diabetes (Iacobucci, 2025). More data has been reported that 18 deaths linked to the use of Mounjaro with 10 relating to weight loss and eight related to type 2 diabetes, and a total of 29 deaths with the use of Ozempic (Iacobucci, 2025). Alison Cave, The Chief safety officer of the MHRA has commented on the figures and has expressed concerns on the use of the drug she explains that “The decision to start, continue, or stop treatments should be made jointly by patients and their doctor, based on full consideration of benefits and risks” (Iacobucci, 2025).

The media and public perception of the use of GLP-1.

The media has presented mixed views on the use of the GLP-1 (ref). With some reports of improvements with mood and reduced anxiety (ref). While others report increased depression and insomnia (ref). While other platforms on social media discuss bias frames on the GLP-1 and its use for weight loss creating a stigma against people using the drug in the perception of the drug being a quick fix and a short cut this can be perceived as laziness and implying that diet and exercise is the right way to become healthier (Markey, 2025). This type of narrative and has significant impact on users' mental health and can increase shame and body dissatisfaction (Markey, 2025). Clinical and research reporting also indicates bias information as some controlled studies found no significant increase on psychiatric events and reports improvements on mental health (Nishida, 2025). While other studies have highlighted increased anxiety and depression (Cornelia's, 2024). However, the MHRA have stated they have found no evidence on the link based on available evidence (BMJ, 2025).

Conclusion.

The results from the complications in using the GLP-1's are alarming and can put some people off taking the medication however, when it comes to any medication and the science behind it, all medication can have adverse or even severe side effects if taken inappropriately such as taken too much paracetamol or misuse of the medication can lead to medical attention. Therefore, there needs to be clear and

more informed information when using the GLP-1 to ensure patient safety and best results are achieved alongside the right diet and exercise to the individual. As obesity is one of the highest leading cause of death and it has been declared a global epidemic the use of GLP-1 is clear that it is a breakthrough in medical science and with the data of the effects of weight loss shows that it could make a contribution to help lower numbers of obesity and public health however, there are a number of people who are misusing the drug for cosmetic and aesthetic reasons which can lead to eating disorders and body dysmorphia resulting in a significant impact to mental health and well-being. This is my there must be a consultation first from medical staff to ensure the disruption of the medication is thought through and is administered for the right dose to the individuals BMI to ensure patient safety. To the individuals needs or wishes to use GLP-1 for weight loss purposes should always proceed with a health care consultant such as their GP to ensure its the right treatment for them to ensure dosage is correct and there is an understanding of side effects and to know what symptoms to look for when taking the medication.

Word count 2,972

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