

Terminology and classification of miracle slimming diets: A narrative review and new proposals

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ABSTRACT

Introduction: In the last years, confusing or misleading use of the term called miracle or magic diets, using to weight loss treatment, has increased, along with several classification of them.

Objectives: The purpose of this narrative review is to discuss miracle slimming diets and proposal new term and new classification for these diets.

Methods: A narrative review up to September 2021 was carried out in the PubMed, Google Scholar, and Web of Knowledge. Furthermore, this strategy was complemented with a comprehensive search of the 'grey' literature [7] based in four different searching strategies: i) grey literature databases, ii) customized Google search engines, iii) targeted websites, and iv) consultation with contact experts.

Results: Our proposal is to use the new concept called hazardous slimming diets defined as diets that propose rapid weight loss (> 1 kg/week), to be performed effortlessly, without the super-vision of a medical/nutritional professional, excessive energy restrictions and/or exclusion from the diet of food or nutrients for the body. Furthermore, the development of a new algorithm reflected as is possible to classify the diet as non-effective, hazardous and effective diet. **Conclusions:** Our review could help to classify and develop a new terminology about the miracle slimming diets focusing in the

knowledge to guarantee the quality in the treatments for weight loss.

KEYWORDS

Miracle diet, magic diet, hazardous diet, weight loss, obesity.

INTRODUCTION

Nowadays, obesity is defined as an escalating global epidemic being focused as a new battlefield with implications in terms of public health, social and economic issues¹. At the same time, the market of weight loss products and programs is growing². American citizens using products and services to weight loss which generate an expenditure of about \$33 billion annually³, and Gibbs⁴ extracted from Marketdata Enterprises that Americans spent, in 2004, \$46 billion on these weight-loss products and services. Moreover, it is estimated that Spanish citizens spend on miracle products about €2,050 million annually⁵ or they bought several books about weight loss, which no included scientific demonstration in around 67% of sold books⁶.

We conducted a literature search with keywords "slimming diets", "miracle slimming diets", "magic slimming diets", "miracle weight loss" and "magic weight loss" in common databases such as PubMed, Google Scholar, and Web of Knowledge up to September 2021. Furthermore, this strategy was complemented with a comprehensive search of the 'grey' literature⁷ based in four different searching strategies: i) grey literature databases, ii) customized Google search engines, iii) targeted websites, and iv) consultation with contact experts. In this narrative review, we focus on clarifying and classifying miracle slimming diets and proposal new term and new classification for these diets to help to guarantee future studies.

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TERMINOLOGY OF MIRACLE SLIMMING DIETS AND NEW CONCEPT PROPOSAL

Miracle slimming diets are defined as the treatment that promise surprising effects on health, and particularly on loss weight⁸ or fast weight loss without effort⁹. This term must not be confused with fad diets, which is defined as dietary treatment that begins with intense and widely shared enthusiasm for something, especially one that is short-lived¹⁰. However, not all fad diets should be included as miracle slimming diets. In fact, Brown et al.¹¹ indicated that the Mediterranean diet should be included as a fad diet promoted for losing weight. In our viewpoint, the term "miracle diet" is not appropriate in scientific literature due to that has a religious connotation and is applied to unusual, remarkable events that it is assumed would not have occurred in the context in question if not for the intentional activity of a supernatural being. These diets are completely wrong and hazardous.

Some authors^{12,13} mentioned this treatment also as "magical diet", being recorded, at the first time, by Bender¹⁴, and referred to diets claiming to result in weight loss, increased lifespan, and the curation of several pathologies based on unverified virtues attributed to "natural" foods or products. On the other hand, other terminologies, such as fake or unhealthy diets, have been used to define these treatments¹⁵. We think that the variety of definitions may give rise to confusion. In fact, a quote attributed to Albert Einstein says that "Everything must be made as simple as possible, but not simpler"¹⁶. For this reason, the terminological consistency of miracle diet is that its particular hazard to health and it is that simple.

We proposed a new redesign called "hazardous diet" and the following new definition: "hazardous diet proposed rapid weight loss (> 1 kg/week), to be performed effortlessly, without the supervision of a medical/nutritional professional, excessive energy restrictions and/or exclusion from the diet of food or nutrients for the body". Table 1 shows characteristics of the hazardous diet proposal in this narrative review.

CLASSIFICATION OF HAZARDOUS SLIMMING DIETS

Nowadays, there are two classifications of these diets; as are magic^{14,17,18} and miracle^{6,19} but their use is not practical due to that some of them are repeated in two categories.

According to this section, these diets can be classified as follows;

- *Magic diet*^{14,17,18}:
 - *Non-balanced hypocaloric diet*. It is low in energy, but unbalanced, i.e. "Mayo diet" (no relationship to Mayo Clinic) provided 600-800 kcal/day²⁰.
 - *Dissociative diet*. It is based on careful food combining, i.e. "Israeli Army diet" justified the consumption only apples for two days, next only cheese (as much as you like) for two days, then only chicken for two days, and, lastly, salads for two days, but favoured headaches and gastrointestinal symptom²¹.
 - *Exclusive diet*. It is based on eliminating some nutrient from the diet, i.e. "Pritikin Diet" which recommended a diet low in fats and high in complex carbohydrates, but

Table 1. Characteristics of hazardous diet

They promise...	<ul style="list-style-type: none"> - Rapid weight loss (more than 1 kg/week). - Be performed effortlessly. - Without the supervision of a nutritional professional. - Excessive energy restrictions. - Exclusion from the diet of food or nutrients for the body.
They do not take into account...	<ul style="list-style-type: none"> - Individual variability and propose a single system for everyone. - The complexity of human nutrition (simplistic principles are not worth it). - The amounts of food clearly. - The number of meals to be made each day. - Its design is made by the intervention of unqualified health professionals
They make recommendations...	<ul style="list-style-type: none"> - From "good" and "bad" foods. - Of complex dishes without specifying the recipe. - Diametrically opposed to scientific knowledge and that contradict health groups of recognized reputation. - Established and/or followed by famous people, without university health training or by professionals who have not studied nutrition, as a means of inducing consumption. - That its non-follow-up may cause damage to health. - Forcing the interested party to buy a specific product that, curiously, is marketed by whoever proposes the diet or system. - Based on a single or no scientific study. - Too pretty to be true.

it might increase, in the first 2 weeks of the diet, the urine production and fluid shifts may require adjustment of medications for hypertension, heart failure, and diabetes²².

- *Psychological diet*. An example of this group is "mental diet" which is based on the premise "imagine yourself slim, be slim"¹⁷.
- *Others (monodiet, liquid and baseless diet) diets*. They are miscellaneous of treatment outside of the previous diets.
- *Miracle diet*^{6,19}:
 - *Very-low-energy diets*. It provided 400-<800 kcal/day. Gargallo Fernández Manuel et al.²³ and Wing et al.²⁴ indicated that adverse effects of these diets could include asthenia, weakness, dizziness, constipation, nausea and others such as dry skin, hair loss and menstrual irregularities, among others, while the poor-quality protein and loose medical supervision resulted in about 60 deaths due to loss of lean body mass and in particular, cardiac muscle atrophy²⁵. An example of this group is Cambridge Diet which reflected case reports of biliary colic²⁶ and insulinoma²⁷.
 - *Low-energy diets*. It indicated 800-1000 kcal/day. Headache and constipation are adverse effects in the use of these diets²⁸.
 - *Hypoenergetic diets*. It suggested 1000-1200 kcal/day. The use of long-term of these diets resulted in an inadequate vitamin and mineral intake²⁹.
 - *Low-carb and high-fat and high-protein diets*. It recommended low intake of carbohydrates and high intake of foods with significant protein and fat content³⁰.
 - *High-carb diets*. It applied low protein (0.5 g/kg/day) and fat (10% or less of the total energy intake). The American Heart Association indicated cautions against the use of such diets because their high carbohydrate content can increase triglyceride levels. In addition, the diets with high fibre intakes, over twice (40–70 g/day) of the recommended amount, can decrease the absorption of zinc, calcium and iron. Complaints of abdominal fullness have also been reported^{31,32}.
 - *Monodiets*. It is based on consuming one particular food^{6,19}.
 - *Picturesque diets*. They used some kind of quirk to convince people that they are easy to follow (followers)^{6,19}.

NEW PROPOSAL OF CLASSIFICATION OF HAZARDOUS SLIMMING DIETS

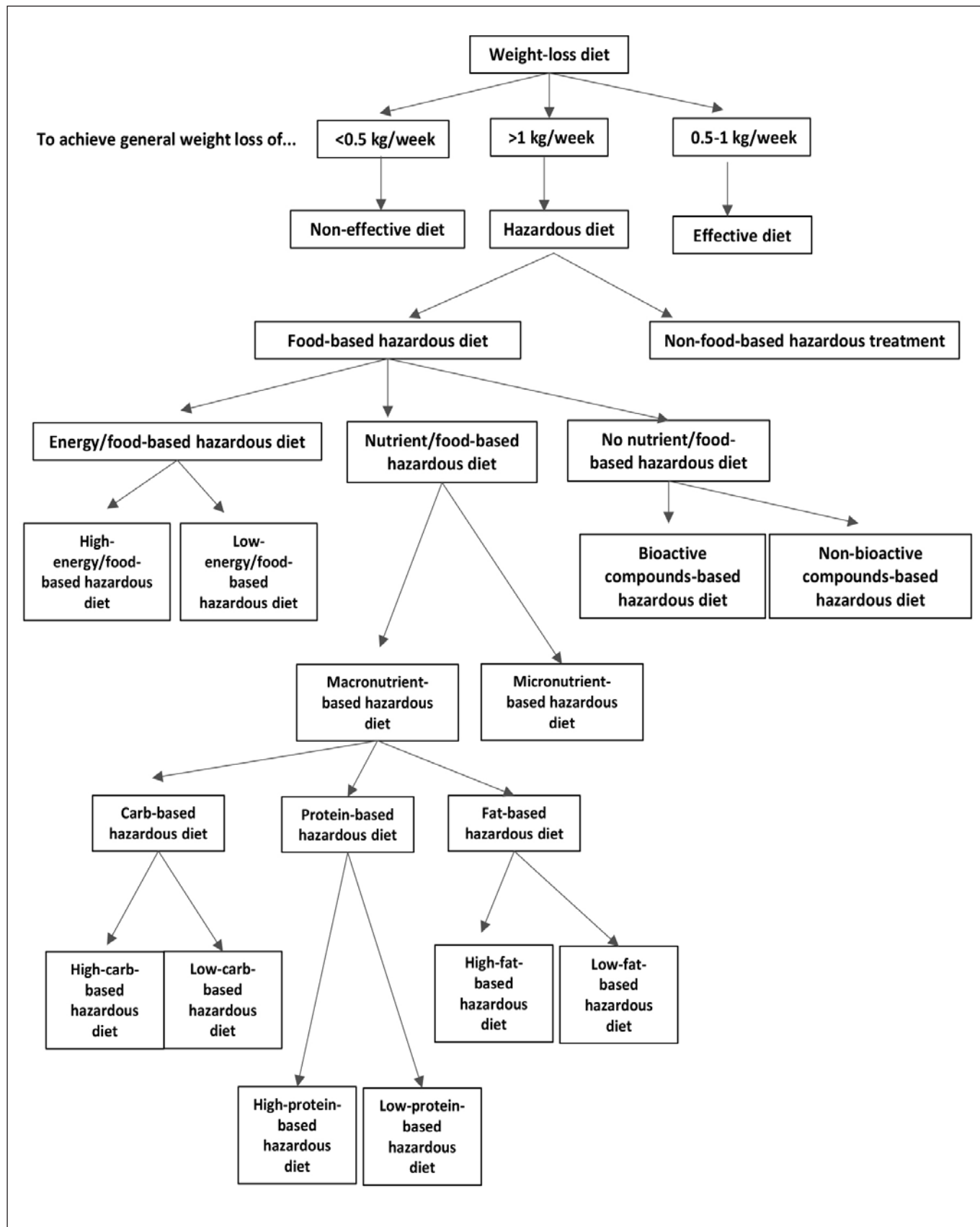
According to the Spanish Society for the Study of Obesity³³, non-effective and effective diets are classified

when they are achieved general weight loss of <0.5 and 0.5-1 kg/week, respectively. Figure 1 shows the new algorithm applied to type of diet (non-effective, hazardous and effective diet).

According to new proposal classification of hazardous diets, which are classified as follows;

- *Non-food-based hazardous treatment*. Non-food-based hazardous diet would be wrong concept due to that, literally, the concept of diet in nutrition is referred to the sum of foods consumed by a person. In this category, it is included different slimming hazardous treatment non-based foods. An example is the "Tapeworm diet" emerged at the beginning of 1900s, which is based in the intake of a capsule containing the parasite eggs, so the adult tapeworms could eat some of the partially digested food. However, its use could cause abdominal pain and discomfort, cramps, colic, diarrhoea, nausea, dizziness, vomiting, vertigo, headache, tiredness, malabsorption, anorexia, muscle pain, constipation, vitamin deficiency, anaemia, intestinal obstruction, perforation jejunal, appendicitis and pancreatitis³⁴.
- *Food-based hazardous diet*:
 - *Energy/food-based hazardous diet*:
 - ✓ *High-energy/food-based hazardous diet*. As contradictory as it may seem, some diets suggested weight loss consuming high quantity of food energy, i.e., Humplik's diet³⁵ developed by a Viennese dermatologist, named Hein Humplik, which proposes a dietary treatment to lose weight consisting of a period of three-day trial and, on the afternoon of the third, up to 10 meals a day are made being able to reach up to 6000 Kcal per day (that is, three times more than the daily amounts guidelines of the European Union, according to Regulation 1169/2011³⁶ on the food information provided to the consumer) for three weeks. The 10 meals are set to an average of 1 meal every 2 hours, with no limit on the amount of food, but depending on hunger.
 - ✓ *Low-energy/food-based hazardous diet*. Nowadays, there is no standard definition of a very low energy (VLED) and low-energy (LED) diets across countries. However, Andela et al.³⁷ indicated that VLED and LED have a very low total energy intake, less than or equal to 3360 kJ/day (≤ 800 kcal/day) and from >3360- ≤ 4187 kJ/day (> 800 - ≤ 1000 kcal/day). An example of VLED is the plan developed by an osteopath called Robert Linn who published the treatment known as "The Last Chance Diet"³⁸. Isner et al.³⁹ described seventeen patients who died suddenly and unexpectedly during or shortly after use of this diet.

Figure 1. Proposed algorithm to classify slimming diets



◦ *Nutrient/food-based hazardous diet:*✓ *Macronutrient-based hazardous diet:*■ *Carb-based hazardous diet:*

❖ *High-carb-based hazardous diet.* i.e., The Pritikin diet⁴⁰ indicated weight loss up to a maximum of 1.8 kg/week, establishing a consumption of <10, 10-15 and 75-80% of fat, protein and complex carbohydrates, respectively, along with <25 mg/day (regression diet) or <100 mg/day (maintenance diet) of cholesterol. The study of this treatment by Li and Heber²² reflected that in patients with hypertension, heart failure and diabetes, should be required adjustment of their medications first and foremost in two weeks of the diet due to an increase of urine production and fluid shifts.

❖ *Low-carb-based hazardous diet.* Oh et al.⁴¹ indicated that the values of <10% (or 20-50 g/day), <26% (or 130 g/day), 26-44% and ≥45% of this macronutrient are used to define very low-, low-, moderate- and high-carbohydrate diets, respectively. Soenen et al.⁴² observed that a low-carb-based diet had no effect on decrease body-weight and fat mass. However, this effect can be reversed when is combined with a high-protein treatment, helping to establish body-weight loss and weight-maintenance^{42,43}. A low carbohydrate diet has common short-term side-effects including constipation, fatigue, halitosis, headache, thirst, polyuria, rash and chest pain, among others⁴⁴, while the long-term disadvantages are high cholesterol level, accelerate the progression of pre-existing kidney disease and increased urinary calcium excretion⁴⁵. An example is Atkins diet, which is, at the same time, a low-carb and high-fat diets⁴⁶.

■ *Protein-based hazardous diet:*

❖ *High-protein-based hazardous diet.* An example is Dukan Diet. This treatment is considered fraudulent and dangerous⁴⁷. Furthermore, it was tested by the University of Granada, in laboratory rats (according to the first phase of the four that consists of the Dukan diet), which developed severe kidney problems including formation of kidney stones, a decrease of up to 88% in urinary citrate and a pH markedly more acid urinary⁴⁸. In 2014, a case report⁴⁹ reflected that a woman 42-year-old Iranian after two days of starting the Dukan diet is admitted with nausea, vomiting and a secondary ketoacidosis

and Wyka et al.⁵⁰ observed 51 women who followed this diet reducing 15 kg in weight during the treatment for 8 to 10 weeks (means losing up to 1.87 kg/week), but it could be a health risk causing osteoporosis and kidney disease, liver and cardiovascular diseases.

❖ *Low-protein-based hazardous diet.* Hallmarks of the Beverly Hills diet are restricting proteins and consuming large quantities of fruit. This diet was established by actress Judy Mazel⁵¹ and promised reducing 1.16 kg/week. Furthermore, it has conceptual mistakes in physiology and food science, like when indicating that "the absorption of some foods only occurs if it is accompanied by others rich in enzymes and hydrochloric acid, which contain some tropical fruits". In fact, The American Medical Association⁵² declared as the worst option among fast diets. In addition to causing diarrhoea, it is deficient in protein, wears out vital muscles and tissues, and is deficient in minerals and vitamins.

■ *Fat-based hazardous diet:*

❖ *High-fat-based hazardous diet.* It has a 55-65% of fat and associate a less than 100g of carb being similar to low-carb-based hazardous diet, as explained in the previous section.

❖ *Low-fat-based hazardous diet.* It is divided in two groups; i) very-low-fat (≤10%), and ii) low fat (11-19%) diets. In 2004, Astrup's group⁵³ carried out an original study, establishing a supermarket at his university, where people could get free food, and after a long selection of candidates, he establishes two groups, where one of them would consume foods rich in carbohydrates, and the other, a diet low and in fat rich in protein. The final results showed that those who follow the second diet manage to lose up to 5 kg more than the other group, because they consume fewer calories and because it reflects, for the first time, that proteins have a satiating effect. In fact, these diets achieve weight loss during the first days, due to the use of glycogen and body water. However, it has been seen that they can increase plasma cholesterol and increase uric acid (which causes gout), and patients who have interrupted this diet have rapidly increased their weight due to the replacement of glycogen and water.

✓ *Micronutrient-based hazardous diet.* While the possibility that arsenic, as micronutrient below normal levels of exposure, is controversial⁵⁴, we have proposed

the only hazardous diet identified in this category, which is known as "Arsenic diet". It was established, at the end of the 19th century, by the consumption of pills containing arsenic, which was announced by the effect of accelerating the metabolism. Although, its concentration was small, were still dangerous especially for those who desperate to lose weight, they took more pills than normal⁵⁵.

✓ *Non-nutrient/food-based hazardous diet:*

- *Bioactive compounds-based hazardous diet:* Konstantinidi and Koutelidakis⁵⁶ carried out a review about the use of bioactive compounds, as are catechins, gallic acid, anthocyanins, quercetin and oleuropein, among others, on weight management and concluded that the evidence is controversial. Nowadays, advertisements are misleading in relationship the applicability of individual or collective bioactive compounds to weight loss and is necessary to obtain more clinical and epidemiological studies to evaluate this effect in the human body.
- *Non-bioactive compounds-based hazardous diet:* Patients consumed non-nutrient compounds which are included in some foods or drinks, as is the alcohol (ethanol). This substance is non-nutrient but provides calories. Example of this diet is the so-called "the point count diet" written by Carise⁵⁷ who was a well-known Viennese dancer who toured all of Europe with Josephine Baker and Marga Berndt, from the late 1920s to the following decade, appearing in, 1927, in the silent film (one of the first movies that uses an innovative colour system, called patheColor) called "La Revue Des Revues" directed by Joe Francis. Carise reflected as one of the pillars of her book is to indicate that with the consumption of highly caloric foods and a lot of alcohol it is possible to lose weight.

CONCLUSIONS

This narrative review could help to classify and develop a new terminology about the miracle slimming diets focussing in the knowledge to guarantee the quality in the treatments for weight loss.

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