

# The dangerous coexistence of type 1 diabetes and eating disorders: a call for action

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## Key words

Type 1 diabetes  
Eating disorders  
Anorexia nervosa  
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Comorbidity  
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Pandemic

## Abstract

Eating disorders are more common among adolescents with type 1 diabetes than in the general peer-group population. This coexistence is often associated with poor glycaemic control and an increased risk of developing severe medical complications. In turn, type 1 diabetes may contribute to the maintenance of eating-disorder psychopathology, and in some cases hinder its treatment. Unfortunately, eating disorders are often not detected by health professionals involved in the management of type 1 diabetes, with negative repercussions on the outcomes of the respective conditions. The increase in the incidence of eating disorders among adolescents during the COVID-19 pandemic, likely also in people with type 1 diabetes, highlights the need to allocate resources for training health professionals involved in the management of type 1 diabetes to detect the early signs of eating disorders with the help of new, specific screening tools. It is also necessary to improve the rapid referral of patients to clinical services that implement the evidence-based treatments recommended for eating disorders, which must work in close contact with the diabetes team. Finally, future research should focus on better identifying the factors that increase the risk of eating disorders in people with type 1 diabetes to prevent the onset of this dangerous, and often undetected, comorbidity.

The first description of the dangerous coexistence of type 1 diabetes with eating disorders was published in the 1980s (Szmukler, 1984). Initially, the specificity of this association was uncertain. However, in the last two decades, systematic research has found that eating disorders are more prevalent in adolescents with type 1 diabetes than in their general population peers (7.0% vs. 2.8%, respectively) (Young et al., 2013). Although no data is yet available, the increased incidence of eating disorders among adolescents during the COVID-19 pandemic (Taquet, Geddes, Luciano, & Harrison, 2021) must also have been mirrored in people with type 1 diabetes, with potentially dangerous physical and psychosocial effects. Indeed, eating disorders in people with type 1 diabetes are associated with poor glycaemic control and an increased risk of developing severe medical complications (Pinhas-Hamiel, Hamiel, & Levy-Shraga, 2015). At the

same time, type 1 diabetes may contribute to maintaining eating-disorder psychopathology and creating a barrier to treatment (Dalle Grave & Calugi, 2020).

In this commentary, I address some critical clinical and research challenges posed by the coexistence of eating disorders and type 1 diabetes that need to be addressed by healthcare stakeholders, suggesting avenues for future research.

## Diagnostic issues

A key strategy for improving the outcome of eating disorders is their early identification and timely management (Potterton, Richards, Allen, & Schmidt, 2019). Unfortunately, the diagnosis of eating disorders in adolescents with type 1 diabetes is often made late, because patients tend to hide

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or deny the adoption of extreme weight-control behaviours. In addition, paediatricians tend under-report rates of eating disorders among patients with type 1 diabetes (Hanley Burden et al., 2021), as they rarely use dedicated screening tools for disordered eating. This means that the opportunity for early detection and intervention is often lost.

Another problem is that the self-reported questionnaires designed to assess eating-disorder psychopathology and the prevalence of eating disorders are not appropriate for adolescents with type 1 diabetes (Dalle Grave & Calugi, 2020). Indeed, they lack items to assess the specific extreme weight-control strategies used by individuals with type 1 diabetes, such as reducing or omitting insulin. Furthermore, they may overestimate the prevalence of eating disorders because some eating features considered disturbed (e.g., limiting the intake of some food groups and eating when not hungry) are often recommended for the management of diabetes.

The 16-item Diabetes Eating Problem Survey-Revised (DEPS-R) is the most widely used tool in screening for the presence of 'disordered eating' in people with type 1 diabetes (Markowitz et al., 2010). However, the DEPS-R is not designed to detect eating disorders per se; although it does screen for some specific abnormal weight-control behaviours adopted by individuals with type 1 diabetes (e.g., omitting insulin after overeating, avoiding measuring blood sugar when thinking it is outside the appropriate range, trying to keep blood glucose high to lose weight, trying to eat to the point of expelling ketones in the urine), it lacks specific questions aimed at assessing the core eating-disorder psychopathology, namely the overvaluation of shape, weight, eating and their control.

## Risk factors

A recent genome-wide association study has revealed a potential genetic link between diabetes and eating disorders (Watson et al., 2019). The study identified eight significant genome-wide loci for anorexia nervosa, and significant genetic correlations with other psychiatric and metabolic disorders (including glycaemic), as well as lipid and anthropometric traits, independent of the effects of common variants associated with BMI. Type 1 diabetes and eating disorders also share some potential risk factors, such as depression (de Groot, Anderson, Freedland, Clouse, & Lustman, 2001; Domargård et al., 1999) and a higher body mass index (BMI) (Domargård et al., 1999)

The increased prevalence of eating disorders in individuals with type 1 diabetes has also been explained by the

shared interaction of two specific cognitive-behavioural mechanisms (Dalle Grave, Sartirana, & Calugi, 2021). The first occurs when people with a need to tightly control various aspects of their lives (e.g., school, sports performance) shift their focus to their control of eating, particularly as regards carbohydrate intake; carbohydrate intake control is central to standard treatments for type 1 diabetes, but in such individuals may lead to the overvaluation of eating control. The second potential mechanism is the internalization of the thin ideal, facilitated by intensive insulin treatment, which may result in some weight gain; this may also prompt the preoccupation with and overvaluation of shape, weight, eating and their control. In both cases, the result is the adoption of strict dieting, which in turn reinforces the need for control over eating, shape and weight.

## Interactions between eating disorders and type 1 diabetes

Type 1 diabetes interacts negatively with eating disorders through two main mechanisms (Dalle Grave et al., 2021): (i) individuals reduce or omit insulin doses to control their weight by eliminating glucose through the urine; (ii) insulin-induced hunger makes it difficult to control food intake and may increase preoccupation with shape, weight and eating control. In turn, some features of eating disorders (e.g., binge-eating episodes) compromise glycaemic control, and increase the risk of acute diabetic complications, such as diabetic ketoacidosis and diabetes-related microvascular and neurological complications, ultimately leading to hospitalization (Peveler et al., 2005).

A negative interaction between the two conditions has been dramatically supported by a Scandinavian study showing that after about ten years of follow-up, mortality rates were 34.6 (per 1,000 person-years) for type 1 diabetes associated with anorexia nervosa, as compared to 2.2 for type 1 diabetes alone, and 7.3 for anorexia nervosa (Nielsen, Emborg, & Mølbak, 2002).

## Treatment

The early detection and management of eating-disorder psychopathology by referral to clinicians delivering the best evidence-based treatments are crucial to preventing acute and long-term complications of type 1 diabetes, and reduce the risk of developing persistent eating disorders that are associated with severe and lasting physical and psychosocial impairment.

For adolescents with eating disorders, the NICE guidelines recommend eating disorder-focused family therapy or cognitive-behavioural therapy, or adolescent-focused psychotherapy (National Institute for Health and Care and Clinical Excellence, 2017). In most cases, these specialist psychological treatments for eating disorders are not hindered by type 1 diabetes. Nevertheless, it is essential that both treatment teams are well versed in both conditions, liaise regularly, and make certain accommodations. In particular, the diabetologist should be aware that there may be a transient deterioration in glycaemic control associated with weight regain (in those who are underweight) and the introduction of avoided foods—two key procedures in the management of eating disorders. In close contact with the eating-disorder team, the reference diabetes team should help patients monitor their glycaemic index and make the necessary insulin adjustment. In young patients, it is also crucial to involve parents with a view to creating an optimal domestic environment to facilitate the management of both conditions, and to help their children implement the necessary treatment procedures (Dalle Grave & el Khazen, 2022). In a minority of patients, particularly those with severe anorexia nervosa and type 1 diabetes, or those who experience repeated episodes of ketoacidosis due to insulin omission, hospitalization in a specialized eating-disorder unit may be indicated.

## Conclusions

The coexistence of type 1 diabetes and eating disorders is extremely dangerous, but often remains undetected or inadequately managed. To prevent the negative consequences on the outcome of the two conditions combined, resources must be allocated to train health professionals involved in the management of type 1 diabetes to detect the signs of eating disorders early. Research into developing specific screening tools for the early detection of eating disorders in people with type 1 diabetes to be routinely implemented in clinical practice is also pressing, especially in light of the reported increase in the incidence of eating disorders associated with the COVID-19 pandemic. There is also the need to improve the rapid referral to clinical services implementing the recommended evidence-based treatments for eating disorders, which should work in tandem with the diabetes team. Finally, it is crucial to focus on research to improve our knowledge on the factors that increase the risk of eating disorders in people with type 1 diabetes to prevent the onset of this dangerous coexistence.

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