QUALITY IN SPORT
eISSN 2450-3118 · Open Access · Peer-reviewed
apcz.umk.pl/QS Nicolaus Copernicus University in Toruń

KMIECIK, Izabela, FIKS, Justyna, KUKLA, Monika, BULICZ, Anna, KOZŁOWSKI, Sebastian, KOWALCZYK, Olga, DZIARNOWSKA, Joanna, KASPRZYCKA, Izabela, ZDUNEK, Marta and STODULSKI, Maciej. Chronic complications of bulimia nervosa: a narrative review. Quality in Sport. 2026;68:74309. https://doi.org/10.12775/QS.2026.68.74309

ARTICLE TIMELINE
Received: 14.07.2026. Revised: 02.08.2026. Accepted: 02.08.2026. Published: 13.08.2026.

The journal has been awarded 20 points in the parametric evaluation by the Polish Ministry of Higher Education and Science (Annex to the announcement of 05.01.2024, No. 32553). Unique Journal Identifier: 201398. Scientific disciplines assigned: Economics and finance (Field of social sciences); Management and Quality Sciences (Field of social sciences).
Punkty Ministerialne z 2019 – aktualny rok 20 punktów. Załącznik do komunikatu Ministra Szkolnictwa Wyższego i Nauki z dnia 05.01.2024 Lp. 32553. Posiada Unikatowy Identyfikator Czasopisma: 201398. Przypisane dyscypliny naukowe: Ekonomia i finanse (Dziedzina nauk społecznych); Nauki o zarządzaniu i jakości (Dziedzina nauk społecznych).

Chronic complications of bulimia nervosa: a narrative review

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Abstract:

Background:
Bulimia nervosa is a serious eating disorder characterized by recurrent episodes of binge eating followed by compensatory behaviors such as self-induced vomiting, excessive exercise, or misuse of laxatives and diuretics. Although acute complications are well recognized, the long-term consequences of the disorder are discussed less frequently.

Objective:
This review aims to summarize the most important chronic somatic and psychiatric complications of bulimia nervosa and highlight their clinical relevance.

Methods:
This study was conducted as a narrative review of the literature, primarily using the PubMed database, focusing on publications addressing the long-term complications of bulimia nervosa.

Results:
Chronic complications of bulimia nervosa may affect multiple organ systems and often develop gradually over time. Gastrointestinal involvement may lead to persistent esophageal inflammation and Barrett's esophagus. Cardiovascular complications, frequently associated with hypokalemia and other electrolyte disturbances, include arrhythmias and long-term cardiac dysfunction. Endocrine abnormalities may contribute to reduced bone mineral density, increasing the risk of osteopenia and osteoporosis. Chronic hypokalemia may also result in renal impairment. Psychiatric complications, including depression, anxiety, and substance use disorders, are also common and significantly impair quality of life.

Conclusions:
Bulimia nervosa is associated with a wide range of chronic complications that may remain unrecognized for prolonged periods. Early diagnosis and increased clinical awareness are essential to reduce long-term morbidity and improve patient outcomes.

Keywords: bulimia nervosa; chronic complications; eating disorders; electrolyte disturbances; cardiovascular complications; osteoporosis; psychiatric comorbidity

Introduction

Bulimia nervosa is a serious and relatively common eating disorder. According to the DSM-5 criteria, it is characterized by recurrent episodes of binge eating, during which a person consumes an unusually large amount of food while experiencing a loss of control over eating. These episodes are followed by compensatory behaviors, such as self-induced vomiting, excessive exercise, or misuse of laxatives and diuretics, which are used to prevent weight gain. Body weight and shape strongly influence self-esteem in affected individuals (1,2).

Bulimia nervosa most commonly affects adolescents and young adults and is more frequently diagnosed in women. However, the disorder can occur in people of any age and gender. The lifetime prevalence is estimated to be approximately 1–2% in the general population, with higher rates observed among young females. The disorder may by difficult to recognize, because many patients maintain a normal body weight and often conceal their symptoms for long periods (1,3).

Eating disorders, including bulimia nervosa, are also more common in certain high-risk groups, particularly among athletes. This is especially evident in sports where body weight, physical appearance, or performance play an important role, such as gymnastics, dance, endurance sports, and sports with weight categories. In these disciplines, there is often

considerable pressure to maintain a specific body shape, which may contribute to the development and persistence of disordered eating behaviors (4,5).

Acute complications of bulimia nervosa, including electrolyte disturbances and gastrointestinal problems, are well recognized in clinical practice. In contrast, chronic complications are discussed less frequently despite their important effects on long-term health. These complications often develop gradually and may remain unnoticed for years. As a result, their effect on long-term morbidity and quality of life may be underestimated (3,6,7).

The aim of this review is to summarize the most important chronic medical and psychiatric complications of bulimia nervosa and to highlight their clinical significance. Increased awareness of these long-term consequences is essential for appropriate follow-up and long-term patient care.

Materials and Methods

This study was conducted as a narrative review of the literature focusing on the chronic complications of bulimia nervosa. Relevant publications were identified primarily through searches of the PubMed database.

The search strategy included combinations of keywords such as “bulimia nervosa,” “chronic complications,” “long-term effects,” “electrolyte disturbances,” “cardiovascular complications,” “renal complications,” “gastrointestinal complications,” and “psychiatric comorbidity.” Only articles published in English were included.

The review included various types of publications, including review articles, systematic reviews, meta-analyses, original research articles, and selected case reports relevant to the topic.

Priority was given to studies published between 2011 and 2025 to reflect current knowledge on the long-term complications of bulimia nervosa. However, selected earlier publications were also included when they provided important background information or contributed to the understanding of underlying pathophysiological mechanisms. The literature search was conducted between March 2026 and early May 2026, and the article selection process was completed in early May 2026.

Studies were selected according to their relevance to the topic, with particular emphasis on publications addressing chronic complications specific to bulimia nervosa. Publications addressing eating disorders more broadly were also included when their findings were applicable to the subject of this review.

Approximately 50 publications were initially screened for relevance. After qualitative assessment and exclusion of studies not directly related to chronic complications of bulimia nervosa, 31 references were included in the final review.

Publications focusing exclusively on acute complications were excluded unless they contributed to the understanding of mechanisms leading to chronic outcomes.

The selected studies were reviewed qualitatively, and the available evidence was summarized to provide an overview of the most clinically relevant chronic complications affecting multiple organ systems.

Review

Self-induced vomiting is the most common purging behavior used by patients with bulimia nervosa to compensate for binge eating episodes and prevent weight gain. Recurrent vomiting, together with the misuse of laxatives and diuretics, may lead to significant electrolyte disturbances, particularly hypokalemia. Hypokalemia is considered one of the most clinically important acute complications of bulimia nervosa because of its potentially serious cardiovascular effects (3,6,7).

One of the most dangerous consequences of hypokalemia is QT interval prolongation, which increases the risk of potentially life-threatening arrhythmias, including torsade de pointes. Repeated purging behaviors may also result in hypomagnesemia, which can further aggravate electrolyte disturbances and make hypokalemia more difficult to correct (3,8,9).

Although acute complications are well recognized in clinical practice, chronic complications often develop gradually and may remain unnoticed for long periods. Long-term purging behaviors, especially recurrent self-induced vomiting and laxative misuse, can eventually lead to damage affecting multiple organ systems (1,6,10).

Ocular complications related to bulimia nervosa

Recurrent self-induced vomiting in bulimia nervosa may contribute to transient ocular complications through mechanisms related to the Valsalva manoeuvre. Increased intrathoracic pressure during vomiting leads to a temporary rise in venous pressure within the ocular circulation, which may impair aqueous humour outflow and result in short-term elevations in intraocular pressure. These changes are typically reversible, with intraocular pressure returning to baseline shortly after the episode ends (11,12).

In addition to transient pressure fluctuations, repeated vomiting has been associated with ocular complications such as subconjunctival hemorrhages and Valsalva retinopathy, characterized by retinal hemorrhage caused by a sudden increase in ocular venous pressure. Similar findings have been reported in patients with bulimia nervosa following recurrent vomiting episodes, although persistent elevation of intraocular pressure has not been observed (12,13).

Although these complications are rarely reported in the literature, recurrent vomiting may increase the risk of repeated retinal injury and other vascular changes within the eye over time (11,13).

Dental complications of bulimia nervosa

Chronic dental complications are common in bulimia nervosa and mainly result from repeated exposure of the oral cavity to gastric acid during self-induced vomiting. This may lead to progressive enamel erosion, particularly on the palatal surfaces of the upper teeth. Over time, enamel loss weakens the teeth, increases tooth sensitivity and susceptibility to dental caries. Continued damage may also alter tooth shape and affect normal occlusion (14–16).

Patients with bulimia nervosa may additionally develop enlargement of the salivary glands, especially the parotid glands, which is thought to be associated with repeated vomiting episodes. Altered salivary flow and reduced oral pH may further contribute to long-term oral damage. As a result, chronic bulimia nervosa may lead to significant dental and oral complications that can negatively affect both oral health and quality of life (14–16).

Gastrointestinal complications

Bulimia nervosa is associated with repeated self-induced vomiting, which exposes the esophageal mucosa to gastric acid and may lead to chronic irritation, inflammation, and structural damage. Recurrent vomiting may also contribute to the development of gastroesophageal reflux disease (GERD) through weakening of the lower esophageal sphincter. Long-term acid exposure can result in Barrett's esophagus, a premalignant condition associated with an increased risk of esophageal adenocarcinoma (3,6,7).

Although esophageal adenocarcinoma remains a rare complication of bulimia nervosa, both epidemiological studies and isolated case reports suggest a possible association between chronic purging behaviors and esophageal malignancy. However, the available evidence remains limited, and a direct causal relationship has not been clearly established. Importantly, symptoms such as dysphagia or unexplained weight loss may appear late, and a past history of bulimia nervosa may be overlooked during clinical evaluation (17–19).

In addition to structural abnormalities, functional gastrointestinal disturbances are also common. These include delayed gastric emptying (gastroparesis) and chronic constipation, particularly in patients with prolonged laxative misuse. Although these conditions are usually not life-threatening, they may significantly impair quality of life and contribute to the persistence of disordered eating behaviors (1,3,7).

Endocrine and bone complications of bulimia nervosa

Bulimia nervosa may be associated with long-term endocrine and skeletal complications, mainly as a result of hormonal and nutritional disturbances. Recurrent purging behaviors and chronic nutritional imbalance may disrupt the hypothalamic–pituitary–gonadal axis, leading to menstrual irregularities and impaired reproductive function (1,3,7).

Patients with bulimia nervosa may also exhibit reduced bone mineral density, increasing the risk of osteopenia and osteoporosis. Although bone loss is generally more severe in anorexia

nervosa, evidence suggests that individuals with bulimia nervosa may also be affected, particularly in cases of long-standing illness or coexisting nutritional deficiencies. Reduced bone density may increase susceptibility to fractures and negatively affect long-term health and quality of life (7,20,21).

Renal complications of bulimia nervosa

Chronic kidney complications in bulimia nervosa are primarily associated with long-standing electrolyte disturbances, recurrent dehydration, and prolonged purging behaviors, including laxative and diuretic abuse. Persistent hypokalemia is an important factor contributing to kidney injury and may lead to hypokalemic nephropathy, characterized by tubular damage and progressive decline in kidney function. Repeated episodes of volume depletion may further reduce renal perfusion and contribute to chronic kidney dysfunction (22–24).

In addition, activation of the renin–angiotensin–aldosterone system in response to dehydration may worsen electrolyte imbalance and promote ongoing renal injury. Long-term laxative abuse has also been associated with chronic kidney disease and, in some cases, irreversible renal damage. In severe or prolonged cases of bulimia nervosa, sustained metabolic and electrolyte disturbances may eventually result in significant impairment of kidney function (3,22,25,26).

Cardiovascular complications of bulimia nervosa

Cardiovascular complications in bulimia nervosa are mainly associated with chronic electrolyte disturbances and recurrent purging behaviors. Persistent hypokalemia plays an important role in cardiac dysfunction because it disrupts the electrical activity of the heart and increases the risk of arrhythmias. Hypokalemia has been reported in approximately 14% of patients with bulimia nervosa and represents one of the most clinically significant metabolic complications associated with recurrent purging behaviors. Over time, electrolyte abnormalities may lead to conduction disturbances, including QT interval prolongation, which may increase the risk of serious arrhythmias and cardiac events (3,6,8,9).

Recurrent dehydration and volume depletion may further impair cardiovascular stability by reducing circulating blood volume. In response to chronic fluid loss, activation of the renin–angiotensin–aldosterone system may worsen electrolyte disturbances and contribute to further cardiovascular complications. Repeated metabolic disturbances may also impair myocardial function over time (3,7,27).

Electrocardiographic abnormalities reported in patients with bulimia nervosa are most commonly related to electrolyte imbalance and include QT interval prolongation and other conduction disturbances. Some of these changes may improve after correction of the underlying metabolic abnormalities and appropriate treatment (8–10).

Cardiovascular complications are among the most serious consequences of bulimia nervosa because of the risk of life-threatening arrhythmias (3,28).

Dermatological complications of bulimia nervosa

Chronic dermatological complications in bulimia nervosa are mainly related to repeated mechanical trauma, nutritional imbalance, and prolonged metabolic abnormalities. One of the most characteristic findings is Russell's sign, which presents as calluses or scars on the dorsum of the hand caused by repeated trauma during self-induced vomiting (29,30).

Persistent dehydration and inadequate nutritional intake may lead to dry skin, reduced skin elasticity, and increased skin fragility. Long-term nutritional and metabolic disturbances may also contribute to hair thinning, increased hair loss, and brittle nails. Impaired wound healing can additionally occur as a result of chronic nutritional deficiencies and ongoing physiological stress (29,30).

Although these manifestations are generally not life-threatening, they represent visible consequences of chronic disease and may significantly affect quality of life.

Psychiatric and psychological complications of bulimia nervosa

Bulimia nervosa is often associated with psychiatric and psychological complications that can negatively affect quality of life and everyday functioning. The disorder commonly co-occurs with mood disorders, particularly depression, as well as anxiety disorders. Some studies suggest that depressive disorders may affect approximately 50–70% of individuals with bulimia nervosa, while anxiety disorders have been reported in 25–75% of affected patients. Comorbid substance use disorders have been reported in approximately 20% of patients with eating disorders. These conditions may persist even after partial improvement of eating-related symptoms and can complicate treatment and recovery (1,31).

Patients with bulimia nervosa often experience low self-esteem, distorted body image, and excessive concern about body weight and shape. Difficulties with emotional regulation are also common and may contribute to recurrent binge–purge behaviors. Increased impulsivity has also been reported in many patients and may make the disorder more persistent (1,31).

Bulimia nervosa is also associated with a higher risk of substance use disorders and self-harm behaviors. These psychiatric and psychological complications may negatively affect interpersonal relationships, academic performance, and functioning at work, leading to long-term psychosocial difficulties. Importantly, some psychological features may be present before the onset of the disorder and continue even after symptomatic improvement (1,31).

Table 1. Chronic complications of bulimia nervosa across organ systems.

System	Chronic complications	Main mechanisms
Gastrointestinal	Chronic esophagitis, Barrett's esophagus, increased risk of esophageal adenocarcinoma, delayed gastric emptying, functional dyspepsia	Recurrent vomiting, chronic exposure to gastric acid, esophageal irritation and inflammation
Dental	Enamel erosion, dental caries, dentin hypersensitivity, increased tooth wear, parotid gland enlargement	Repeated exposure to gastric acid, dehydration, vomiting
Ocular	Subconjunctival hemorrhage, Valsalva retinopathy, transient increase in intraocular pressure	Valsalva maneuvers during vomiting, increased venous pressure
Renal	Hypokalemic nephropathy, chronic kidney disease, nephrocalcinosis	Chronic hypokalemia, volume depletion, metabolic alkalosis
Cardiovascular	Arrhythmias, QT prolongation, structural cardiac changes, reduced cardiac function	Electrolyte disturbances (especially hypokalemia), dehydration, autonomic dysfunction
Endocrine and bone	Osteopenia, osteoporosis, menstrual disturbances, reproductive dysfunction	Hormonal imbalance, nutritional deficiencies, hypogonadism, low body weight
Dermatological	Russell's sign (callused knuckles), dry skin, hair loss, brittle nails, delayed wound healing	Mechanical trauma from vomiting, nutritional deficiencies, dehydration
Psychiatric	Depression, anxiety disorders, insomnia, substance use disorders, personality disorders (e.g., borderline personality disorder), persistent emotional dysregulation	Multifactorial: neurobiological vulnerability, psychological factors, chronic stress, maladaptive coping mechanisms

QT – corrected QT interval.

Discussion

Bulimia nervosa may lead to chronic complications affecting multiple organ systems and negatively affect long-term health. The consequences of the disorder extend beyond the gastrointestinal tract and may involve dental, ocular, renal, cardiovascular, endocrine, dermatological, and psychiatric complications. Many of these complications are linked to recurrent purging behaviors, chronic electrolyte disturbances, and long-term metabolic imbalance (1,3,6).

Most chronic complications develop gradually as a result of repeated physiological stress rather than isolated acute events. Recurrent vomiting exposes tissues to gastric acid and repeated pressure changes related to the Valsalva manoeuvre, contributing to both dental and ocular injury. At the same time, chronic electrolyte disturbances, especially hypokalemia, play a major role in the development of renal and cardiovascular complications, showing that bulimia nervosa may affect multiple organ systems.

Although some complications may initially be reversible, repeated exposure over time can lead to persistent structural and functional damage. This is particularly evident in dental erosion, renal impairment, and cardiovascular abnormalities, where long-standing disturbances may eventually lead to permanent damage. Early recognition and timely intervention are therefore essential to reduce the risk of irreversible complications.

The psychiatric aspect of bulimia nervosa also contributes to its chronic course. Coexisting mood and anxiety disorders, together with psychological features such as impulsivity and emotional dysregulation, may both predispose individuals to the disorder and make recovery more difficult. This highlights the importance of treating both the physical and psychological aspects of bulimia nervosa (1,31).

Although current studies provide important information about the chronic complications of bulimia nervosa, several limitations remain. Many studies examine eating disorders as a broader group, making it difficult to distinguish findings specific to bulimia nervosa. In addition, long-term data are still limited, and more research focused specifically on bulimia nervosa is needed to better understand its long-term course and outcomes.

Overall, bulimia nervosa may lead to serious long-term complications affecting both physical and mental health. Eating disorders are also associated with increased mortality risk, particularly in patients with long-standing disease and psychiatric comorbidity. Greater awareness of its chronic complications may support earlier diagnosis, more comprehensive care, and better long-term outcomes for affected individuals(28).

Conclusion

Bulimia nervosa is associated with chronic complications that may affect multiple organ systems and significantly impair long-term health. Many of these complications are related to recurrent purging behaviors, chronic electrolyte disturbances, and prolonged metabolic imbalance. Although some changes may initially be reversible, repeated exposure over time can lead to permanent organ damage and persistent functional impairment.

Early recognition and comprehensive treatment are essential to reduce long-term morbidity and improve patient outcomes. Further studies focused specifically on bulimia nervosa are needed to better understand its chronic complications and support the development of effective prevention and treatment strategies.

Disclosure

Author's Contribution

Conceptualization: Izabela Kmieck
Formal analysis: Izabela Kmiecik, Monika Kukla
Investigation: Izabela Kmiecik
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Writing – review and editing: All authors

All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Funding

This research received no external funding.

Ethical Approval

Ethical approval was not required because this study was based exclusively on previously published literature.

Informed Consent

Informed consent was not required because no human participants were involved in this study.

Data Availability

No new data were created or analyzed in this study. All information discussed in this review was obtained from previously published sources.

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