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SCIENTIFIC EVOLUTION AND GLOBAL TRENDS IN THE STUDY OF MORBID OBESITY AND MENTAL HEALTH INTERCONNECTIONS

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The purpose of the study was to conduct a bibliometric analysis of the world catalogue of scientific literature, which was indexed in leading scientific databases in order to identify the time dynamics of the issue, its structure, and the most common research vectors of the comorbidity of morbid obesity and affective pathology. The quantitative and structural-analytical method was chosen and a specialised search query used that combined terms relevant to severe obesity and anxiety-depressive disorders. The year of publication, type of document, industry membership, geographic and institutional distribution and funding profiles were reviewed. The findings showed a steady interest increase to this scientific field and that original clinical studies and systematic reviews were the most common. The United States and Chinese research centres were the most productive contributors in terms of the number of publications, which is based on the globalisation of interdisciplinary enquiry in the fields of bariatric medicine and psychiatry. The thematic distribution validates the collaboration of the clinical, neurobiological, and immunometabolic approaches. According to a synthesis of existing research, there is a bidirectional pathophysiological connection between morbid obesity and anxiety-depressive disorders, with the key roles being played by chronic low-grade inflammation, neuroinflammation, hypothalamic-pituitary-adrenal axis dysregulation, insulin resistance, and neuroplasticity losses. The tendency of linking the severity of obesity to psychological distress proves the importance of including psychiatric screening into the management regimes of the severely obese patients. These findings support the development of this field as an independent interdisciplinary area and shed light on the opportunities to create individualized treatment approaches in consideration of immunometabolic phenotype and the impact of chronic stress.

Key words: morbid obesity, anxiety-depressive disorders, neuroinflammation, psychological distress, immunometabolic dysfunction.

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НАУКОВА ЕВОЛЮЦІЯ ТА ГЛОБАЛЬНІ ТЕНДЕНЦІЇ У ВИВЧЕННІ ВЗАСМОВ'ЯЗКІВ МІЖ МОРБІДНИМ ОЖИРІННЯМ ТА ПСИХІЧНИМ ЗДОРОВ'ЯМ

Метою дослідження було проведення бібліометричного аналізу світового каталогу наукової літератури, індексованої у провідних наукових метричних базах даних, з метою виявлення часової динаміки проблеми, її структури та найпоширеніших векторів досліджень коморбідності морбідного ожиріння та афективної патології. Було обрано кількісно-структурно-аналітичний метод та використано спеціалізований пошуковий запит, що поєднував терміни, пов'язані з тяжким ожирінням та тривожно-депресивними розладами. Було проаналізовано рік публікації, тип документа, галузеву приналежність, географічний та інституційний розподіл і профілі фінансування. Результати показали постійне зростання інтересу до цієї наукової галузі, і найпоширенішими були оригінальні клінічні дослідження та систематичні огляди. Найбільш продуктивними з точки зору кількості публікацій були дослідницькі центри США та Китаю, що базуються на глобалізації міждисциплінарних досліджень у галузі бариатричної медицини та психіатрії. Тематичний розподіл підтверджує взаємодію клінічних, нейробіологічних та імунометаболічних підходів. Згідно з узагальненням існуючих досліджень, між морбідним ожирінням та тривожно-депресивними розладами існує двосторонній патофізіологічний зв'язок, в якому ключову роль відіграють хронічне слабе запалення, нейрозапалення, порушення регуляції гіпоталамо-гіпофізарно-наднирковозалозної осі, інсулінорезистентність та втрата нейропластичності. Тенденція пов'язувати тяжкість ожиріння з психологічним дистресом доводить важливість включення психіатричного скринінгу в схеми лікування пацієнтів з тяжким ожирінням. Ці висновки підтримують розвиток цієї галузі як незалежної міждисциплінарної сфери та проливають світло на можливості створення індивідуалізованих підходів до лікування з урахуванням імунометаболічного фенотипу та впливу хронічного стресу.

Ключові слова: морбідне ожиріння, тривожно-депресивні розлади, нейрозапалення, психологічний дистрес, імунометаболічна дисфункція.

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Morbid obesity is categorized as a chronic, progressive, and recurrent metabolic disorder that goes beyond excessive adiposity only [7, 24]. Pathologically, it is characterised by the accumulation of adipose tissue and is objectively defined by a body mass index (BMI) ≥ 40 kg/m² or, in case of comorbidities like type 2 diabetes mellitus, obstructive sleep apnoea syndrome, or severe arterial hypertension, by a BMI ≥ 35 kg/m² [5, 8, 18, 28]. Morbid obesity is considered an independent nosological entity that is inherently multisystemic and triggers a pathophysiological cascade of structural and functional changes in the endocrine,

cardiovascular, hepatobiliary, and musculoskeletal systems.

The pathology of morbid obesity is multifactorial and is based on the interplay of intricate interactions between genetic factors, neuroendocrine dysregulations, and socioeconomic factors [2, 23]. The genetic variations that regulate energy homeostasis are intricately intertwined with hypothalamic dysfunction and failures in leptin, ghrelin, and insulin signalling [4, 17]. The key pathogenic node of morbid obesity includes chronic low-intensity inflammation (meta-inflammation) and oxidative stress. As endocrine-active cells,

hypertrophied adipocytes release pro-inflammatory cytokines (TNF- α , IL-1 β , IL-6) that, in addition to maintaining insulin resistance, can cross the blood-brain barrier, thereby triggering neuroinflammation [19, 34].

It is also important not to overlook that dysfunction of the central nervous system and, in particular, disruption of the hypothalamic-pituitary-adrenal axis and the neuroendocrine mechanisms of appetite regulation are prominent features of the disease's pathogenesis [3, 14, 22]. The possibility of adipose tissue overcoming its energy-storing functions and becoming an endocrine and paracrine organ in morbid obesity has been demonstrated [27, 33]. High concentrations of adipocytokines trigger events that lead to desensitisation of insulin and leptin receptors, thereby initiating a vicious cycle of metabolic degradation [15, 16]. Therefore, morbid obesity presents itself as a complex pathophysiological continuum in which the deep-seated metabolic dysfunctions are strictly coupled with cognitive and psycho-emotional disorders [26, 32, 35]. These pathophysiological mechanisms understanding is crucial for obesity and its comorbidities. effective treatment development.

Recent scientific discussions have focused on the interdependence between morbid obesity and psychiatric conditions, especially in the anxiety-depressive continuum [11]. Among others, metabolic and immune dysregulation has a direct effect on neurotransmitter systems, which provokes affective symptoms, and anxiety and depression are the triggers of disordered eating, reduced patient compliance, and obstacles to effective therapeutic interventions, such as bariatric surgery [6, 10].

Morbid obesity is a complex biopsychosocial condition where the psycho-emotional and metabolic disruptions are integrated into the same pathophysiological continuum [30]. The accelerated growth of scientific literature in this field and the emergence of new multidisciplinary methods require the systematic generalization of global experience. Bibliometric analysis is not only a means of evaluating the dynamics of scientific discourse but also an opportunity to identify global research vectors, which are highly critical for optimizing medical care approaches for this group of patients.

The purpose of the study was to conduct a bibliometric analysis of the overall collection of academic sources indexed in leading databases, with the aim of identifying significant trends and vectors in the development of research on anxiety and depressive disorders among patients with morbid obesity.

Materials and methods. To achieve the goal of the review, three main literature searches were conducted in the databases PubMed, Google Scholar, Web of Science, and SCOPUS, covering English-language scientific articles from 01.01.2020 to 01.01.2025. The last search query was performed on May 21, 2025.

A bibliometric approach was adopted to meet this objective; it entailed a quantitative and structural-analytical status of scientific publications. The used international scientometric databases allowed creating a representative set of publications to evaluate the current trends in science in the field of study of anxiety and depressive disorders among morbidly obese subjects.

The sample consisted of publications indexed in the Scopus scientific database, which is indicative of increased scientific activity on the topic. The search was conducted using a specialised query with logical operators (AND, OR, NOT) and truncated terms to account for variability in the key concepts. Publications pertaining to author affiliations in the Russian Federation were not included in the analysis to ensure scientific relevance and adherence to the existing international context. Selection based on the set criteria was automated, forming the final sample.

Bibliometric analysis database was formed with the help of a specialised search query: ((TITLE-ABS-KEY (“morbid* obes*” OR “class III obes*” OR “severe* obes*” OR “extreme* obes*” OR “bariatric patient*”)) AND (TITLE-ABS-KEY (“anxi* OR depress*” OR “mood disorder*” OR “affective disorder*” OR “psychological distress*”)) AND NOT (AFFILCOUNTRY (“Russia” OR “Russian Federation”))).

The bibliometric analysis entailed evaluating quantitative and structural indicators. The key parameters were: dynamics of the publishing activity over the years, which allowed tracking the changes in the scientific interest; the typology of documents (original research, reviews, conference materials, etc.); the sectoralisation of publications by the Scopus classification; geographical distribution of scientific productivity; institutional activity, and the input of individual authors. In this way, it was possible to confer major research centres, interdisciplinary connections, and prevailing thematic areas in the study of the problem. To visualise the results, statistical tools from the used database platforms were used to create graphical presentations of dynamics in publications, document structure, and scientific activity distribution within a country and an institution. Data summarisation was done using comparative and trend analysis.

Exclusion criteria were also considered important. Conference abstracts, editorials, preprints, and non-peer-reviewed articles were excluded because they did not align with the review objectives.

As this is a review article based on the analysis of publicly available literature, ethical approvals were not required for this study. The study protocol was performed in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Hence, a total of 2606 articles were selected. After removing duplicates and records that did not meet the inclusion criteria, a portion was selected for full-text review. Therefore, 33 manuscripts were determined to meet the inclusion criteria (Table 1).

Simplified PRISMA Flow

Stage	Description	Number of Records/Studies
1. Identified	Total number of records identified through database searching and other sources	2606
2. Duplicates Removed	Number of records removed before screening (e.g., duplicates)	276
3. Screened (Title/Abstract)	Number of records screened after duplicates were removed	2330
4. Assessed for Eligibility (Full-text)	Number of full-text articles assessed for eligibility against the inclusion/exclusion criteria	106
5. Included in Review	Total number of primary studies finally included in the systematic review	35

The study did not require additional ethical approval, as it used publicly available scientometric data without any personally identifiable or confidential information.

Results of the study and their discussion. As the bibliometric search of the PubMed, Google Scholar, Web of Science, and Scopus databases revealed, the overall number of publications on anxiety and depressive disorders among patients with morbid obesity is 2606. The chronological analysis indicates that there has always been scientific interest, beginning in the late 1950s; however, until the early 1990s, the number of publications was minimal, with no more than a few per year. Publication activity has been gradually increasing since the beginning of the 2000s, but has grown exponentially since 2010. The dynamics are even more evident during the time scale of 2018-2023, as the number of interdisciplinary studies on the relationship between morbid obesity and mental disorders has increased significantly. The greatest rates of publication activities were obtained in 2022 (191 documents), 2021 (174) and 2020 (168), which indicates that scientific attention to this issue has reached its peak in the post-pandemic era. The number of publications is also consistently high (148 documents annually) in 2024-2025, which demonstrates the topicality of the issue. The obtained dynamics indicate that interest in research on psychoemotional disorders in morbid obesity is gradually increasing, likely related to the emergence of neuroimmunological ideas, the global rise in obesity prevalence, and greater consideration of patients' quality of life and mental well-being.

The structural analysis of the scientific publications identified in the studied databases reveals that original scientific articles dominate other document types. Among all 2606 publications, 2083 works are articles (79.9%), which represents the prevalence of empirical research in the field of the study of anxiety and depressive disorders among morbidly obese patients. Such a structure validates the dynamic nature of the research in this area, which is both clinical, experimental, and interdisciplinary. In the list of shares, it ranks second with 295 publications (11.3%), indicating that there is sufficient information to support systematic generalisation, meta-analysis, and conceptual models of the relationship between morbid obesity and mental disorders.

The fact that there are many review articles speaks to the sophistication of the scientific field. Letters to the editor – 80 (3.1%), book chapters – 44 (1.7%), notes – 32 (1.2%), editorial materials – 29 (1.1%), and conference materials – 27 (1.0%), comprise a smaller portion but still show another, yet less comprehensive, kind of scientific communication. The 11 publications (0.4%) that represent short surveys, and the 0.1% each of the errata and retracted articles, represent the generally accepted indicators in international scientometric databases. Overall, the system of document types suggests the prevalence of full-format scientific works, with a progressive rise in the role of generalising review publications, indicating the active formation of the topic area and the growing dominance of the scientific direction in the field of interdisciplinary research on metabolic and psycho-emotional disorders.

The subject area distribution of scientific publications can be used to show how intensively the research on anxieties and depressive disorders in patients with morbid obesity is interdisciplinary. The most significant collection of publications is in the medical field of search – 2398 publications (61.6%), which is also understandable due to the clinical orientation of the topic and the preeminence of the medical method of research. Another outstanding input is nursing, with 706 publications (18.1%), highlighting the role of clinical management, patient support, and quality-of-life aspects in the organization of the research.

Psychology is the domain covered by 233 documents (6.0%), and it involves the systematic examination of the affective and behavioural aspects of obesity. The significant role is played by disciplines such as biochemistry, genetics, and molecular biology, with 198 publications (5.1%), which are associated with an interest in the molecular and neuroimmune mechanisms underlying the development of comorbid psychoemotional disorders.

Neuroscience (92 publications; 2.4%) further highlights interest in neurobiological processes, neuroinflammation, neuroplasticity, and dysfunction of the central nervous system. The social sciences account for less than 59 publications (1.5%); pharmacology, toxicology, and pharmaceuticals – 47 (1.2%); agricultural and biological sciences – 40 (1.0%); and others, whose total share is not more

than 2 %. This distribution demonstrates the creation of an integrative research model that unites the clinical, psychosocial, and molecular-biological models.

The information provided proves that the issue of anxiety-depressive disorders in morbid obesity is a pervasively multidisciplinary issue, in which clinical medicine prevails and where the involvement of psychological and biomedical sciences plays an important role as well, which shows the contemporary tendency to a complex study of metabolic-psychiatric comorbidity.

According to the evaluation of publication density by sources indexed in the studied databases, it is apparent that scientific publications have been concentrated in specialised journals on obesity, bariatric surgery, and other interdisciplinary fields. Thus, the journal *Obesity Surgery* ranks first with 409 publications, indicating that the surgical and bariatric vector dominated publications on anxiety and depressive disorders in morbid obesity.

The second most prolific journal is *Surgery for Obesity and Related Diseases*, with 172 publications, confirming the ongoing incorporation of the psycho-emotional factor into the sphere of bariatric medicine. The other main articles appear in *International Journal of Obesity* (54 publications), *Eating and Weight Disorders* (44), *Obesity* (35), *Surgical Endoscopy* (29), *Clinical Obesity* (23), and the *International Journal of Eating Disorders* (20). Such a variety of sources and publications indicates the interdisciplinary character of the problem, which encompasses approaches as diverse as surgery, endocrinology, psychiatry, and behavioural sciences.

Meanwhile, the presence of publications in psychology-oriented journals demonstrates the growing interest in the affective and behavioural aspects of morbid obesity.

The second top-ranked surgery, *Obesity and Related Diseases*, has 172 publications confirming the active incorporation of psycho-emotional issues into bariatric medicine. Others with the highest publication counts are the *International Journal of Obesity* (54), *Eating and Weight Disorders* (44), *Obesity* (35), *Surgical Endoscopy* (29), *Clinical Obesity* (23), and the *International Journal of Eating Disorders* (20). Such an allocation of the sources of publication testifies to the complexity of the problem, which is an interdisciplinary phenomenon encompassing surgical, endocrinological, psychiatric, and behavioural strategies.

The fact that most studies on obesity and bariatric surgery in the literature are published in specialised journals reflects the high clinical relevance of the research and its incorporation into practice. Simultaneously, the existence of psychology-oriented publications also demonstrates the increasing interest in the affective and behavioural aspects of morbid obesity. The year-by-year dynamic analysis reveals that the number of publications in the major journals remains very low until 2010, then increases gradually, reaching its

highest levels in 2018-2023, which are in accordance with the overall trend in scientific interest in the comorbidity of metabolic and mental disorders.

These results reveal the emergence of a stable scientific trend in the international academic community with a concentration of publications in high-ranking specialised journals that define the existing discourse in the research on morbid obesity and its anxiety and depressive disorders.

Studies of author productivity identified the most prominent researchers influencing the existing scientific discourse on psycho-emotional disorders in the context of morbid obesity. The results suggest that there is a comparatively small group of authors who are highly active in publications, a typical attribute of a mature research direction. Meanwhile, it is important to add that not every publication reviewed is specifically focused on the anxiety and depression disorders in morbid obesity, yet expands the scope of the issues concerning the psychobehavioural, clinical, and metabolic functioning of severe obesity.

The most productive author is Sarwer, D.B., with 33 publications, which demonstrates her significant contributions to research on psychobehavioral factors in obesity and bariatric medicine. There is also high scientific productivity among Mitchell JE (31 publications) and Sockalingam S (31 publications), whose research interests include psychiatric, behavioural, and clinical aspects in patients with severe obesity.

Wadden, T.A. (23 publications), Grilo, C.M. (19), Hawa, R. (19), King, W.C. (19), Wnuk, S. (18), and Dixon, J.B. (17) also belong to the group of the leading authors. Their work spans a broad range of investigative focus, including the psychopathology of obesity and the outcomes of bariatric treatment, behavioural interventions, and the evaluation of patients' psychoemotional condition.

The author's detected organization of activity focuses on the interdisciplinary nature of the field of science and the integration of psychiatric, psychological, endocrinological, and bariatric methods. The fact that the publications are concentrated by a comparatively small number of researchers speaks of the creation of permanent scientific and international scientific schools in this area of study.

A geographical distribution study of scientific articles indexed in the Scopus database indicates a high level of internationalization of studies on psychoemotional disorders in the context of morbid obesity. Among the 2606 publications, the United States is the unquestioned leader, with the largest number of works (more than 1000), indicating that American research centres play the primary role in shaping the current research agenda in the area.

The United Kingdom ranks second (approximately 200 publications), reflecting the significant participation of European research communities. Canada (143 publications), Germany (136), Italy (135), Australia (110), Brazil (108),

France (105), and Spain (100 publications) are among the countries with significant scientific activity.

This distribution confirms the international character of research and also shows the concentration of scientific productivity in countries with advanced systems of bariatric care, psychiatric services, and interdisciplinary research centres. The hegemony of North America and Western Europe is in line with epidemiological evidence on the high incidence of morbid obesity and the active establishment of bariatric medicine in these areas.

The obtained results suggest that the problem of comorbidity of morbid obesity and anxiety-depressive disorders has a long-standing international interest and underlines the presence of the tendency of globalisation of scientific research in the given direction.

The method of institutional analysis of the studied publications made it possible to identify the foremost scientific and medical centres that influence the development of the present research in the field of psychoemotional disorders in morbid obesity. The results show a significant concentration of scientific productivity in major universities and clinical centers across North America and Europe. The greatest number of publications is observed at the University of Toronto, with 54 works, underscoring the great importance of Canadian research schools in the development of this issue. Harvard Medical School (45 publications) and Yale School of Medicine (42 publications), which are traditionally strong centres of clinical and psychiatric research, also rank highly. The Karolinska Institute (40 publications), Inserm (35), the Mayo Clinic (34), the University Health Network (34), Monash University (31 publications), and the University of Michigan, Ann Arbor (31 publications) is also among the top institutions in this field. The scientific activities of these centres encompass a broad spectrum of fields, including bariatric surgery, metabolic research, and psychiatric and behavioural studies of obesity.

The institutional profile demonstrates that the research is interdisciplinary and dominated by large academic Medical Centres in producing evidence. Simultaneously, it is necessary to add that the publications under analysis relate to the field of morbid obesity and psychoemotional disorders quite broadly, and not all of them are directly focused on anxiety-depressive disorders. Overall, the acquired data suggest that the world of scientific partnerships and a gradual rise in the institutional level of activity in the investigation of the comorbidity of metabolic and mental disorders has been created.

An evaluation of research funding schemes published in European databases showed that major public biomedical agencies played a dominant role in supporting scientific research on psychoemotional disorders in the context of morbid obesity. The findings reveal the evident hegemony of North American grantors in determining the financial foundation of this scientific domain.

The most financed publications belong to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) – 120 publications, which is one of the reasons to consider the metabolic component of obesity as a special interest. A similar contribution was made by the National Institutes of Health (NIH), with 116 publications, which established a systematic body of research on the comorbidity of metabolic and mental disorders in the United States.

The involvement of the National Institute of Mental Health (NIMH) is also significant, with 31 published articles, and the National Centre for Advancing Translational Sciences has 25, indicating increased interest in the psychiatric and translational aspects of the issue. The Bundesministerium für Bildung und Forschung has the largest number of publications among European donors, with 23; the National Heart, Lung, and Blood Institute with 22; and the Canadian Institutes of Health Research with 19 publications each contribute significantly to the funding of research.

Simultaneously, it is worth noting that the publications that received grant funding discuss the topic at the level of leading biomedical agencies and include a wide variety of works on morbid obesity and psychoemotional disorders, not all of which focus solely on the analysis of anxiety and depressive disorders. Overall, the obtained data prove the existing high institutional and financial interest in the investigation of the comorbidity of obesity and mental disorders and suggest a further enhancement of this interdisciplinary research direction.

A bibliometric search of publications indexed in the studied scientometric databases revealed the relevance of the problem of psychoemotional disorders, especially in morbidly obese patients, possessing high relevance and hence the constant increase in scientific interest in the issue. The recognized trends in publication activity, the organization of thematic areas, and the geographical and institutional distribution of studies establish this area as a new, independent interdisciplinary field of bariatric medicine, psychiatry, psychology, and metabolic sciences.

The findings of Francisco Monsalve et al. (2025) indicate a progressive change in scientific interest toward mostly somatic factors of obesity to a holistic evaluation of the mental condition and quality of life in patients with major depressive disorder [25]. The authors demonstrated that both conditions have a bidirectional pathophysiological relationship mediated by chronic low-grade inflammation, hypothalamic-pituitary-adrenal (HPA) axis dysregulation, metabolic and neurotrophic disorders, lipotoxicity, and gut-brain axis dysfunction. It is reiterated that among obese patients, neuroinflammation and mood disorders are caused by high concentrations of pro-inflammatory cytokines (CRP, IL-6, TNF- α), insulin resistance, leptin resistance, as well as intestinal microbiota dysbiosis. Simultaneously, depression correlates

with alterations in monoamine neurotransmission, reduced levels of BDNF, and immunoinflammatory mechanisms, which can predispose people to obesity development. The authors lay stress on the clinical importance of combined mental health screening among patients with obesity and metabolic evaluation among patients with depression.

The role of inflammation as a primary mechanism in the emergence of depression is supported by Cyrino et al. (2021) in their review [9]. The authors demonstrate that activation of the immune system is accompanied by a surge in pro-inflammatory cytokines (IL-1 β , IL-6, and TNF- α), which can affect the brain and alter neurotransmitter activity, especially serotonin, dopamine, and glutamate. In its turn, it is linked to the emergence of such symptoms as anhedonia, loss of motivation, fatigue, and anxiety. Such a chain of pathological processes is associated with dysfunctional mitochondria, leading to severe metabolic disruption in high-energy-demanding neurons and glia. The authors stress that inflammation does not lie in all depressed patients but only in a specific group of patients. In a person with high levels of inflammatory markers, an improved response to anti-inflammatory treatment can be expected. It is independently noted that obesity is regarded as a significant pro-inflammatory risk factor. Pro-inflammatory cytokines are produced by adipose tissue; thus, obesity contributes to chronic low-level inflammation, increasing the risk of developing depressive symptoms.

In this way, depression as a part of the concept is partially considered as an immune-dependent disorder with mutual dependence between metabolic and psychosocial factors that interact with each other through inflammatory pathways and are highly comorbid [12]. The authors view obesity as a condition of sustained immunometabolic inflammation in which adipose tissue disintegrates and releases adipokines and lipokines that act on the central nervous system. The most critical pathogenetic connections are systemic inflammation and neuroinflammation, dysfunction of the corticotrophic-corticocorticoid-adenosine triphosphate axis, dysbiosis of the intestinal microbiota, and decreased neuroplasticity (especially of BDNF). The role of leptin, adiponectin, and lipid mediators is considered, in particular, to be key to identifying a connection between metabolic and affective disorders. These authors also find that there is a common neuroendocrine and inflammatory basis of depression and obesity, and also that adipokines and lipokines should be regarded as potential therapeutic targets.

Fulton et al. (2022) were able to summarize existing data on the relationship between obesity and depression and anxiety disorders [15]. According to the authors, the risk of depression and anxiety is directly proportional to the extent of metabolic dysfunction when it is accompanied by insulin resistance, visceral obesity, arterial hypertension, and

systemic inflammation. The predictors of depression are more accurate with abdominal obesity and high levels of C-reactive protein as compared to body mass index. Chronic low-grade inflammation that is the result of excessive intake of saturated fats and sugars, intestinal dysbiosis, and visceral fat tissue growth represents the primary pathogenesis. The pro-inflammatory cytokines cross the blood-brain barrier or activate neurovascular pathways, leading to neuroinflammation, microglial activation, and disruption of neuroplasticity in corticolimbic structures (hippocampus, amygdala, nucleus accumbens). This is complemented by deregulation of serotonergic and dopaminergic transmission, which is the root of anhedonia and anxiety manifestations.

The contribution of endocrine factors to the development of obesity and comorbidity of depression is discussed individually: insulin resistance, leptin resistance, and dysfunction of the HPA axis. The authors mention the two-way character of the association: depression causes hyperphagia and lack of physical exercise, which worsens the condition of obesity and creates a vicious cycle. Therefore, obesity may be regarded as a metabolic and neuroimmune as well as psychiatric risk factor that necessitates a complex treatment plan according to dietary, metabolic, and psychoneurological processes.

The article by Kundi et al. (2024) examined the correlation between obesity and psychological distress among young adults aged 18-26 years, based on the results of the National Health Interview Survey (2013-2018) [20]. They had 20954 respondents (encompassing over 35 million individuals in the United States). The primary variable of interest was body mass index, and psychological distress was measured using the Kessler K6 scale. Completely adjusted ordinal regression equations also created a dose-dependent association between the severity of obesity and amplified psychological distress: in the case of class II obesity, the OR was 1.29, and in the case of class III obesity, it was 1.39 (95 % CI 1.18–1.64; $p < 0.001$) relative to normal weight. The authors infer that the correlation between severe obesity and psychological distress among young adults remains steady and therefore, mental health screening needs to be incorporated into obesity management programmes with references to the gender and ethnic diversity.

Sayedeh Elham Sharafi et al. (2020) determined the level of anxiety and depression in 732 patients with overweight and obesity attending a specialised clinic [29]. Psychoemotional status was assessed using the Hospital Anxiety and Depression Scale (HADS), and anthropometric measures (BMI, percentage of body fat – PBF, and total muscle mass – SLM) were evaluated using bioimpedance analysis. Clinically significant depression was found in 17.5 % of the surveyed people, and anxiety 26.5 %, with the proportion of both disorders being greater among the obese compared to the overweight population. The

mean BMI and PBF values were statistically significant in the anxious or depressed symptomatic patients. The correlation between BMI and the HADS scores was identified as positive by regression analysis: as the BMI got higher, the degree of anxiety and depressive symptoms also got higher. The authors came to the conclusion that overweight/obesity is directly related to anxiety and depression symptoms, independent of sleep behaviour, and that comorbidity between these two factors is two-way and should be taken into consideration when treating patients with obesity.

In a systematic review and meta-analysis following PRISMA guidelines, Alshahre et al. (2025) summarised findings from 12 cross-sectional studies conducted in Saudi Arabia, comprising a total sample of 17232 individuals, to determine the relationship between obesity and overweight and the incidence of depression and anxiety [1]. This pooled analysis revealed that there was a statistically significant correlation between obesity and general depression (OR = 1.42; 95 % CI 1.07–1.87) and more so severe depression (OR = 1.76; 95 % CI 1.08–2.86). The incidence of depression disorders in obese clients was about 25.02. In terms of anxiety disorders, obesity showed a great correlation with severe anxiety (OR = 1.62; 95 % CI 1.24–2.11), and anxiety prevalence among obese patients was generally high (29.23). The findings affirm the fact that there is a long-standing relationship between obesity and serious cases of affective disorders among the Saudi Arabian population.

The synthesis of the existing epidemiological, clinical, and molecular biological data shows that the comorbidity of morbid obesity and anxiety-depressive disorders can be considered as a systemic one and is developed under the impact of interrelated

immunoinflammatory, neuroendocrine, metabolic, and psychosocial processes. The body of evidence has shown that the individual factors were not studied in a fractional way but in an integrated manner, understanding the entirety of this phenomenon as a biopsychosocial process. In this regard, it's worth mentioning that data on the pathogenetic role of chronic inflammation and neuroinflammation, as one of its varieties, are of great interest and represent an important issue that requires resolution from pathophysiological and therapeutic perspectives [21, 31].

Modern scientific literature is no exception and reminds scientists of the necessity of integrating clinical evaluation of morbidly obese patients into clinical assessment, that is, with the analysis of somatic indicators, it should be systematically screened for their psycho-emotional condition. Simultaneously, investigations of affective disorders must consider patients' metabolic profiles as a possible factor in the progression and response to treatment. This methodology is also in line with the existing paradigm of personalised and translational medicine, in which the integration of clinical, neurobiological, and population-level information is becoming a defining requirement for enhancing the efficacy of medical care.

Limitations. The following limitations were used while working with the selected sources of literature: russian-language sources of literature and those works published in journals of Russian Federation and Belarus were excluded; those sources of literature that were not published in Ukrainian, English and Italian were also excluded; when analyzing selected sources of literature, cases of morbid obesity with a weight of above 150–180 kg were excluded.

Conclusion

A bibliometric review of the scientific PubMed, Google Scholar, Web of Science, and Scopus databases confirms the development of research on anxiety and depressive disorders in morbid obesity as one of the most popular interdisciplinary fields, characterized by research centres in the United States and China. An analysis of the literature demonstrates a bilateral interaction between affective pathology and extreme body weight, with neuroinflammation and dysregulation of neuroendocrine axes as central processes. The correlation between the extent of psychological distress and the extent of obesity is an established fact, which opens the possibility of systematic psychiatric screening (HADS, PHQ-9) as a part of bariatric treatment procedures. Future studies should aim to develop individualised weight-correction measures that account for the influence of the immunometabolic profile and the impact of chronic stress.

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