

Global Research Landscape and Knowledge Evolution on Diabetes Burnout: A Bibliometric Analysis (2015 – September 2025)

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Abstract

Diabetes burnout, characterized by emotional exhaustion and disengagement from self-management, has emerged as a critical psychosocial issue among people with diabetes. Diabetes burnout differs from depression or diabetes distress. Diabetes burnout is primarily marked by emotional exhaustion and disengagement from self-care behaviors. This study aims to systematically map the global research landscape on diabetes burnout and identify emerging research frontiers and knowledge structures within the field. A bibliometric analysis was conducted using the Scopus database, covering publications from January 2015 to September 2025. Bibliometric indicators, including publication trends, authorship patterns, co-citation networks, and keyword co-occurrences, were analyzed using VOSviewer. Thematic evolution and knowledge clusters were further explored to trace conceptual development and interdisciplinary linkages. A total of 860 publications were identified, revealing a substantial increase in annual research output on diabetes burnout over the past decade. Three dominant clusters emerged from the analysis: the *psychological and behavioral dimension* (red cluster), the *clinical and biomedical focus* encompassing insulin, glycemic control, hemoglobin A1c, and blood glucose monitoring (green cluster), and the *self-care and social support aspects* (blue cluster). This bibliometric mapping highlights the multidisciplinary evolution of diabetes burnout research by analyzing key bibliometric indicators such as total link strength, citation metrics, and co-authorship networks. Emerging trends underscore the growing emphasis on digital health interventions, resilience-based programs, and community-driven approaches to mitigate diabetes burnout.

Keywords: Diabetes, burnout, distress, bibliometric analysis, knowledge mapping, good health, well-being

Introduction

Diabetes mellitus is recognized as one of the most significant global health challenges in the twenty-first century. Its prevalence continues to increase worldwide, affecting individuals across all age groups and socioeconomic levels. According to the International Diabetes Federation (2023), more than 530 million adults are currently living with diabetes, and the number is projected to rise by 46% by 2045. Diabetes management requires patients to engage in continuous self-care activities such as diet regulation, physical exercise, medication or insulin adherence, and regular blood glucose monitoring. These ongoing demands frequently lead to emotional fatigue and psychological strain, which, over time, may result in a condition known as diabetes burnout, a state of emotional exhaustion, frustration,

and detachment from self-care behaviors (Jafari et al., 2025).

The primary problem underlying this study is the growing urgency of diabetes burnout as a psychosocial barrier to effective diabetes management. Diabetes burnout differs from depression or diabetes distress, though the three may share overlapping symptoms (Sayed Ahmed et al., 2025; Soliman et al., 2025). It represents a specific condition in which individuals with diabetes experience emotional depletion and disengagement after prolonged efforts to manage their illness. Previous studies have demonstrated that diabetes burnout significantly correlates with poor glycemic control, increased HbA1c levels, decreased treatment adherence, and diminished quality of life (Polonsky et al., 2022; Riise et al., 2025; Stenov et al., 2025). Despite the growing recognition of its clinical and psychological importance, research on diabetes burnout remains fragmented across various disciplines, such as endocrinology, psychology, nursing, and public health (Schmitt et al., 2021). This fragmentation reflects the lack of a unified framework to track its development and identify future research directions. While both clinical and psychological interventions have been explored, including medical treatments, insulin optimization, and self-efficacy training (Abdoli et al., 2020, 2021; Mirghani, 2024), these studies are often context-specific and limited by small sample sizes. Despite an increasing number of empirical studies, no prior bibliometric analysis has systematically mapped the global research landscape on diabetes burnout, nor has it explored how different disciplines have collaborated to shape current knowledge. This gap highlights the need for a comprehensive and integrative approach to identify existing research patterns, collaboration networks, and thematic developments in the field.

Bibliometric analysis systematically investigates the patterns, trends, and interrelationships among published works to identify the structure and evolution of a scientific discipline (Donthu et al., 2021). This method enables researchers to map the intellectual, conceptual, and social dimensions of diabetes burnout research based on quantitative indicators. The study utilizes the Scopus database as the primary source of bibliographic data because it provides comprehensive and reliable coverage of peer-reviewed publications. Using VOSviewer software, this research visualizes co-authorship networks, keyword co-occurrences, and thematic clusters to reveal the global dynamics of the field. This methodological choice is justified by the objectivity, reproducibility, and data-driven strength of bibliometric analysis, which makes it highly suitable for identifying the evolution and structure of emerging research domains.

Diabetes burnout was selected based on three main considerations. First, it represents a critical clinical and psychosocial issue that directly influences treatment adherence, glycemic outcomes, and quality of life among people with diabetes (Macdonald & Campbell, 2017; Mezuk et al., 2025). Second, there is a notable absence of global bibliometric evidence that maps the research landscape and collaborative structure in this area. Third, the study is expected to produce a conceptual and structural knowledge map that identifies dominant research clusters and emerging themes, providing direction for future interdisciplinary studies and policy development.

Therefore, the objective of this study is to identify publication trends, collaboration networks, core journals, influential authors, and thematic clusters in the field. The expected outcomes include a comprehensive understanding of how the topic of diabetes burnout has developed globally, as well as insights into the main research fronts and emerging themes. By generating this evidence-based overview, the study contributes to the advancement of integrated and multidisciplinary strategies for diabetes management. Ultimately, the findings are anticipated to support the development of more effective, person-centered interventions that improve both clinical outcomes and the

psychological well-being of individuals living with diabetes.

Methods

Search Strategy and Data Collection

Bibliometric analysis offers quantitative insights into academic literature by identifying research trends, principal contributors, and the evolution of scientific knowledge. To identify relevant publications, we utilized the Scopus database and implemented targeted search queries to systematically review articles on diabetes burnout. The search was conducted in January 2015 to September 2025. Full counting was applied, with a minimum keyword occurrence threshold of five. This approach ensures that only relevant articles with sufficient keyword frequency were included in the analysis. The search strategy was as follows: (TITLE-ABS-KEY(diabetes burnout) AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"re") OR LIMIT-TO (DOCTYPE,"cp") AND (LIMIT-TO) (LANGUAGE,"English") AND (LIMIT-TO) (PUBSTAGE,"final")). We restricted the search to English-language publications and excluded book chapters and congress abstracts. The search also excluded conference papers (DOCTYPE) To ensure data accuracy, we cross-checked all records. This systematic approach yielded a robust data set for analyzing research patterns, assessing impact, and tracing the progression of diabetes burnout research.

Data Processing and Analysis

The bibliometric process of this study followed four main stages: identification, screening, inclusion, and visualization (Figure 1). In the identification stage, 1,097 records related to diabetes burnout were retrieved from the Scopus database using a predefined search query covering January 2015 to September 2025. In the visualization stage, the dataset was analyzed using VOSviewer software to generate co-authorship, keyword co-occurrence, and thematic cluster maps. This workflow ensured data validity, methodological transparency, and reproducibility in mapping the global research trends on diabetes burnout.

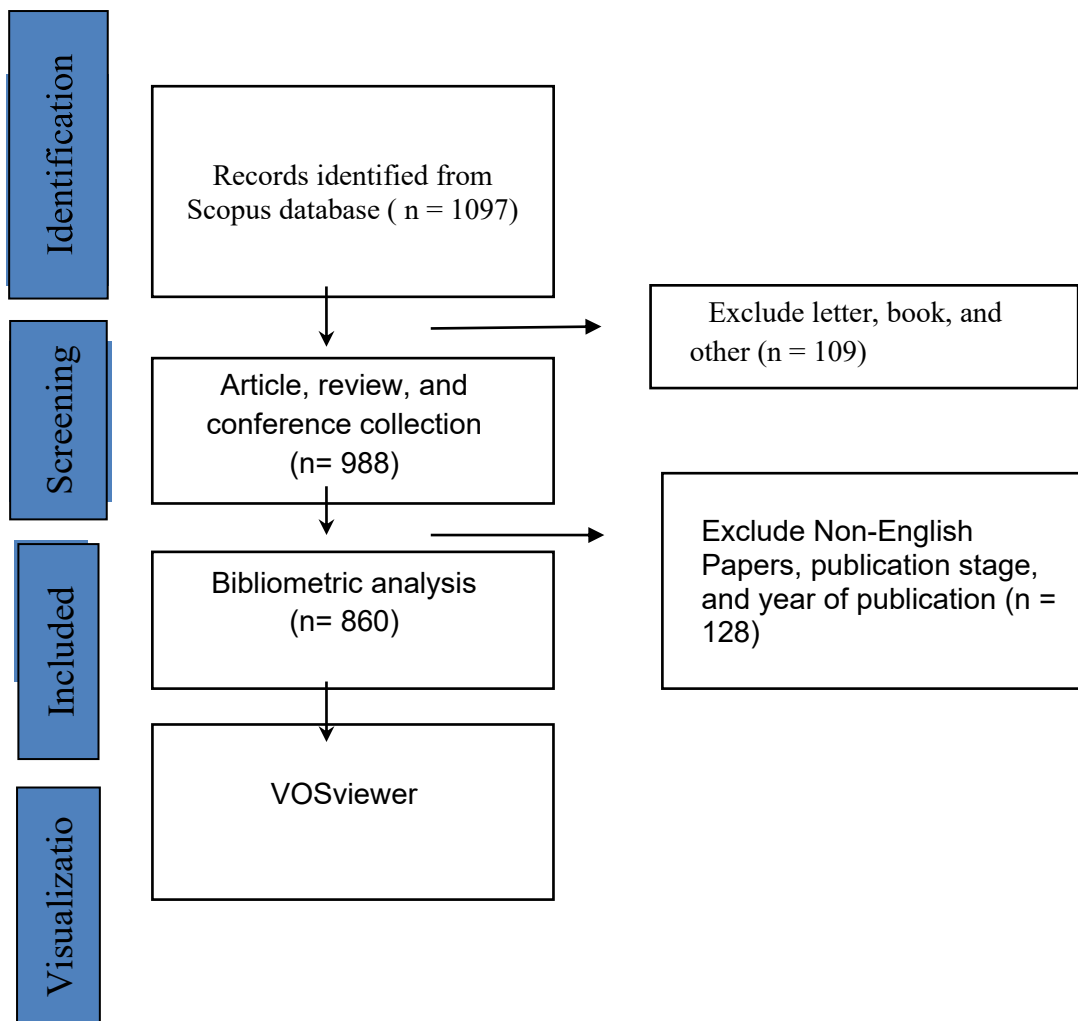


Figure 1. The Bibliometric Process

Results

Number of Publications on Diabetes Burnout in the Scopus Database

This study analyzes the publication trends on diabetes burnout using data extracted from the Scopus database for the period 2015–2025. The analysis identifies a progressive increase in research output, indicating that the topic has gained significant attention from the global scientific community. As shown in Table 1, a total of 860 documents were identified, including research articles, review papers, and conference proceedings that met the inclusion criteria. The annual distribution of publications shows a clear upward trajectory, with the most substantial growth observed between 2020 and 2022. The year 2022 recorded the highest number of publications (n = 142; 16.51%), reflecting the growing recognition of diabetes burnout as a key psychosocial issue in diabetes management. This upward trend illustrates the increasing integration of psychological and behavioral dimensions into clinical diabetes research, marking a shift from traditional biomedical approaches toward biopsychosocial perspectives in chronic disease management.

Table 1. Number of Publications on Diabetes Burnout in the Scopus Database

Year of Publication	Number of Publication	Percentage
2025	104	12.09



2024	137	15.93
2023	126	14.65
2022	142	16.51
2021	93	10.81
2020	74	8.60
2019	43	5.00
2018	45	5.23
2017	47	5.47
2016	26	3.02
2015	23	2.67
Total	860	100

Table 1 indicates a continuous and notable growth of scientific publications related to diabetes burnout over the past decade. Research activity remained relatively modest between 2015 and 2019, reflecting the early stage of conceptual development in this field. A sharp increase occurred beginning in 2020, coinciding with a broader global emphasis on mental health and psychosocial well-being during the COVID-19 pandemic. This surge suggests that the intersection between emotional distress, self-management, and chronic disease care gained heightened scholarly attention during this period.

The consistent rise in publication volume from 2020 to 2025 demonstrates that diabetes burnout has evolved into a recognized interdisciplinary research area integrating clinical, psychological, and behavioral sciences. The pattern also implies that researchers have progressively shifted from examining purely biomedical indicators, such as glycemic control and insulin management, toward exploring emotional exhaustion, self-care adherence, and quality of life. This trend highlights a paradigmatic transition in diabetes research from isolated clinical treatment approaches to holistic, patient-centered frameworks that consider both physiological and psychosocial dimensions of health.

Core Journals in International Research on Diabetes Burnout

This study identified the principal sources of scientific dissemination related to diabetes burnout by analyzing journal publications indexed in the Scopus database from 2015 to 2025. The analysis revealed 25 core journals that have consistently contributed to advancing scholarly understanding of diabetes burnout. These journals represent diverse disciplinary perspectives, including endocrinology, behavioral medicine, nursing, and public health. The distribution of publications across these journals demonstrates the multidisciplinary nature of the field, where clinical and psychological research converge to address the complexities of diabetes self-management. The detailed list of core journals is presented in Table 2.

Table 2. Number of core journals in international publications on diabetes burnout

Ranking	Core Journal Name	Number of Publication
1	Diabetic Medicine	50
2	Diabetes Care	30
3	BMJ Open	25
4	Journal of Diabetes Science and Technology	24
5	Diabetes Research and Clinical Practice	18
6	PLOS ONE	18
7	BMJ Open Diabetes Research and Care	16

Ranking	Core Journal Name	Number of Publication
8	JMIR Diabetes	16
9	Pediatric Diabetes	14
10	Journal of Diabetes and its Complications	13
11	International Journal of Environmental Research and Public Health	13
12	Diabetes Technology and Therapeutics	13
13	Trials	13
14	Frontiers in Clinical Diabetes and Healthcare	12
15	Contemporary Clinical Trials	11
16	Diabetes Therapy	11
17	Journal of Diabetes Research	10
18	Diabetology and Metabolic Syndrome	10
19	Journal of General Internal Medicine	9
20	Journal of Medical Internet Research	9
21	Journal of Pediatric Psychology	9
22	Diabetes, Metabolic Syndrome and Obesity	9
23	Canadian Journal of Diabetes	9
24	Scientific Reports	9
25	Diabetologia	8
Total		379

The data presented in Table 2 show that Diabetic Medicine (50 publications), Diabetes Care (30 publications), and BMJ Open (25 publications) are the leading outlets for diabetes burnout research. The presence of both medical journals (e.g., Diabetic Medicine, Diabetes Research and Clinical Practice) and multidisciplinary journals (e.g., PLOS ONE, BMJ Open, Scientific Reports) indicates strong cross-disciplinary engagement.

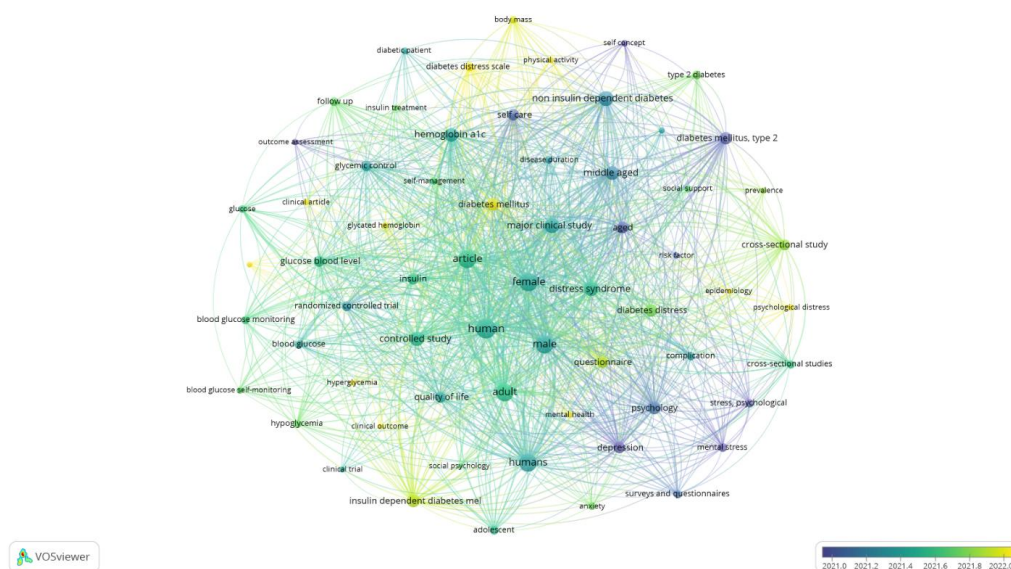


Figure 2. Overlay Visualization Analysis of Keyword Co-occurrence Network

The visualization, presented in Figure 2, illustrates the relationships between keywords based on their co-occurrence frequency within the same publications. Each node represents a keyword, while the links indicate the strength of association between related terms. The overlay visualization in Figure 2 represents the co-occurrence of



keywords in publications on diabetes burnout, with the color gradient indicating the average publication year. Publications from earlier years are colored in blue, while more recent publications are represented in yellow-green. The average publication year for each keyword co-occurrence was calculated by averaging the publication years of the documents in which each keyword appeared. This allows us to trace the chronological development of key research themes in the field. The overlay visualization in Figure 2 demonstrates that research on diabetes burnout is strongly interconnected with themes related to psychological well-being, self-management, glycemic control, and quality of life. Central keywords such as diabetes mellitus, human, quality of life, self-care, and psychology occupy dominant positions within the network, indicating their foundational role in shaping the field. The presence of terms like depression, distress syndrome, self-management, and glycosylated hemoglobin reflects the growing integration of psychological and physiological dimensions in diabetes research.

The color gradient in the visualization corresponds to the average year of publication, highlighting a temporal shift in research focus. Earlier studies (in blue) concentrated on biomedical aspects such as insulin treatment, hemoglobin A1c, and glycemic control, while more recent works (in yellow-green) increasingly emphasize psychosocial variables, including stress, psychological distress, self-concept, and social support. This evolution signifies a conceptual transition from clinical interventions toward holistic, patient-centered models addressing emotional resilience and behavioral adaptation among individuals with diabetes.

Temporal Evolution of Research Themes

The overlay visualization shows a clear temporal shift in the research themes of diabetes distress. Earlier publications (dark blue nodes, around 2020) predominantly featured biomedical terms such as “*blood glucose monitoring*,” “*insulin therapy*,” “*clinical trial*,” and “*glycemic control*.” These reflect the traditional emphasis on clinical management and metabolic optimization, prioritizing objective biomarkers such as HbA1c or fasting glucose levels. This stage represents the classical biomedical paradigm that sought to control diabetes through pharmacological regimens and structured self-monitoring. As the timeline progresses (green and yellow nodes, 2021–2022), a shift in themes toward the psychological and behavioral aspects of diabetes becomes evident. Keywords such as “self-care,” “self-concept,” “social support,” “mental stress,” “depression,” and “quality of life” mark the movement toward understanding diabetes distress as an affective-behavioral phenomenon. This shift aligns with the global shift toward biopsychosocial models of chronic disease, which integrate psychological well-being into standard diabetes management (Fisher et al., 2019; Verma et al., 2025).

The bright yellow nodes on the periphery, including “psychological distress,” “cross-sectional study,” “prevalence,” and “social support,” suggest that epidemiological and population-based research has recently intensified. These studies often quantify the prevalence and predictors of distress and explore the bidirectional links between emotional burden and glycemic outcomes (Mirghani, 2024). The increasing co-occurrence of “social support” and “self-care” underscores the growing recognition that psychosocial environments significantly impact the effectiveness of self-management and health outcomes among patients with type 2 diabetes.

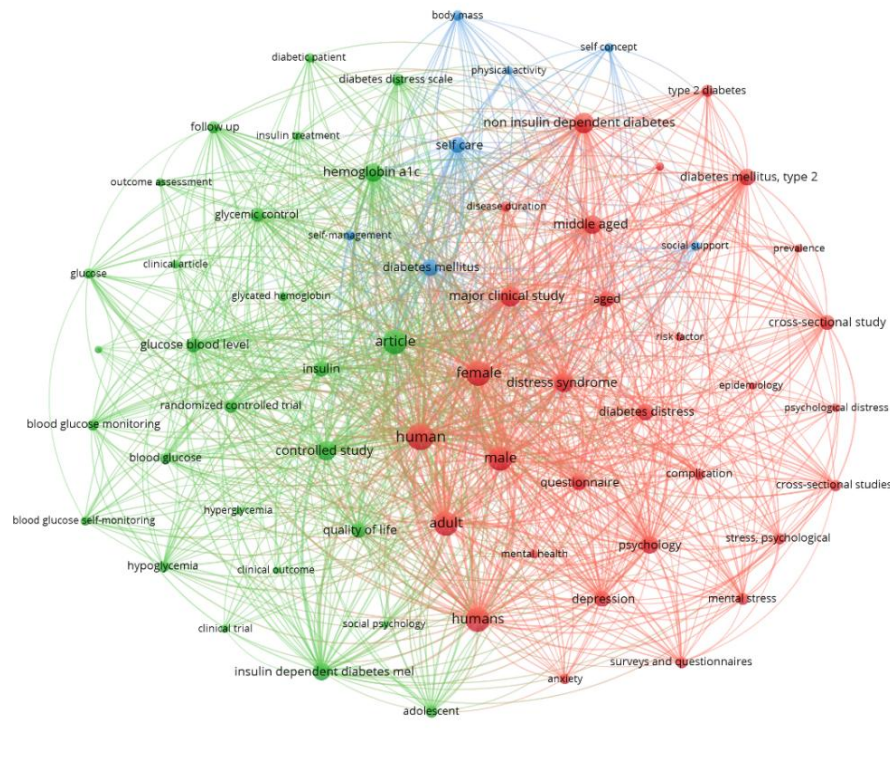


Figure 3. Journal collaboration network

As presented in Figure 3, the visualization demonstrates a complex and cohesive network composed of three primary clusters each representing distinct but interdependent streams of knowledge. The link strength between journals is determined by the link threshold, which represents the minimum number of co-authorships required for a connection to be drawn between two journals. Only journals meeting this threshold are included in the network. The red cluster primarily focuses on the psychological and behavioral dimensions of diabetes burnout. Journals in this cluster, such as *BMJ Open*, *Journal of Pediatric Psychology*, and *Psychology, Health & Medicine*, emphasize emotional regulation, distress management, and quality of life among diabetic patients. These publications reflect an increasing awareness of diabetes not merely as a metabolic disorder, but as a psychosocial phenomenon requiring comprehensive intervention strategies.

The green cluster represents journals centered on clinical and physiological research. Core journals within this group include *Diabetic Medicine*, *Diabetes Care*, and *Diabetes Research and Clinical Practice*. These outlets focus on biomedical parameters such as glycemic control, insulin therapy, and clinical outcomes while beginning to incorporate behavioral variables such as adherence, self-monitoring, and treatment satisfaction. The presence of such journals in the same network as behavioral outlets underscores a gradual paradigm shift in diabetes research from strictly biomedical perspectives toward integrated biopsychosocial frameworks.

Meanwhile, the blue cluster comprises journals that act as interdisciplinary bridges, connecting clinical practice with behavioral science. Examples include *JMIR Diabetes* and *Frontiers in Clinical Diabetes and Healthcare*, which frequently publish studies on digital health innovations, self-management interventions, and psychological support systems. These journals often facilitate cross-disciplinary collaboration among clinicians, psychologists, and

digital health researchers, thereby fostering the convergence of technology and psychosocial care in diabetes management.

The network's overall configuration demonstrates dense interlinkages among clusters, signifying that research on diabetes burnout is no longer confined to a single disciplinary silo. Instead, it represents a collaborative academic ecosystem, where biomedical, psychological, and technological domains intersect. The strong citation links between *Diabetic Medicine* and *BMJ Open*, for instance, suggest frequent cross-referencing between clinical studies and open-access platforms addressing psychosocial determinants of diabetes burnout. Similarly, the recurring appearance of open-access journals within the network reflects an evolving trend toward inclusive and globally accessible scholarship, enabling a wider dissemination of knowledge and evidence-based interventions across regions and disciplines.

Furthermore, the visualization highlights the central role of hybrid journals that publish both quantitative and qualitative research, signifying an increasing appreciation of patient-reported outcomes, self-care behaviors, and mental health indicators. This shift corresponds with global efforts to integrate patient-centered perspectives into chronic disease management and health policy. The interconnections across clusters suggest that diabetes burnout research is evolving toward a holistic and integrative paradigm, emphasizing collaboration between endocrinology, psychology, public health, and digital medicine.

The journal collaboration network presented in Figure 3 illustrates a mature and dynamic research field characterized by strong interdisciplinary synergy. The coexistence of biomedical rigor and psychosocial depth within the same network signals that diabetes burnout has transitioned from a niche topic to a mainstream interdisciplinary domain. From a bibliometric perspective, this intellectual convergence suggests that diabetes burnout research is becoming a strategic area for innovation in clinical psychology, behavioral medicine, and digital health, offering potential insights for scientific advancement and healthcare practice.

Discussion

Overlay Visualization Analysis of Keyword Co-occurrence Network

The overlay visualization of the keyword co-occurrence network provides a detailed overview of the conceptual evolution of diabetes burnout research between January 2015 until September 2025. As presented in Figure 2, the central keywords such as diabetes mellitus, self-management, quality of life, distress, and psychological stress indicate the core themes that have consistently shaped scholarly attention. The color gradient in the visualization, ranging from blue (representing earlier years) to yellow (representing more recent studies), depicts the chronological progression of research topics. Earlier studies focused predominantly on biomedical aspects, including insulin therapy, glycemic control, and hemoglobin A1c, reflecting a traditional medical orientation consistent with the findings of Polonsky and Fisher (2022) who emphasized glycemic regulation as the main concern in diabetes management.

The overlay visualization reveals that the intellectual trajectory of diabetes distress research has evolved from a biomedical-centric paradigm toward a psychosocially integrated framework. The transition from blue to yellow clusters demonstrates a shift in scholarly attention from purely physiological indicators (e.g., HbA1c, glucose levels) to mental health, quality of life, and behavioral regulation. This transformation underscores the increasing adoption of interdisciplinary methodologies, blending endocrinology, psychology, and public health to address the complex

interplay between emotional distress and disease management. The temporal evolution also implies that future research is likely to deepen its focus on psychological resilience, social determinants, and digital-based interventions for self-management and distress reduction in diabetes populations.

Interpretation of the Network Map

The bridging nodes, especially "diabetes mellitus" and "article," are centrally located within the network. They serve to connect all thematic clusters. This centrality shows that many studies take a multidisciplinary approach. These studies treat diabetes as the main phenomenon and examine it from psychological, behavioral, and demographic perspectives. The network map shows a shift toward integrative diabetes research. The medical aspect of glucose regulation now links to psychological distress, self-management behaviors, demographic factors, and social support. Researchers no longer consider these areas in isolation. The frequent co-occurrence of these elements across clusters shows a trend. Researchers are conceptualizing diabetes distress within a biopsychosocial framework. Here, metabolic outcomes, emotional burden, and patient behavior evolve together and influence each other.

This bibliometric mapping yields several implications for future research. Although the clinical and psychosocial domains are well represented, there remain opportunities for mechanistic and longitudinal studies to clarify causal pathways linking distress, self-care behaviors, and glycemic outcomes over time (Juntunen et al., 2022; Kathryn E Nagel, 2025; Tenreiro & Hatipoglu, 2025). The strong association between psychosocial and metabolic keywords indicates that intervention studies integrating psychological components such as cognitive behavioral therapy, stress reduction, and self-efficacy training with metabolic monitoring may produce more effective outcomes (Holloway et al., 2023; Nuari, 2018; Nuari et al., 2023; Tenreiro & Hatipoglu, 2025). Recent trials have targeted both distress reduction and glycemic control (Karahan & Yalçın, 2009; Krstović Spremo et al., 2022). Additionally, emerging topics such as eating-behavior comorbidities, including diabulimia, highlight the need to investigate how extreme behaviors interact with distress in diabetes populations. As digital health, remote monitoring, and personalization become increasingly prominent, future research should also assess how technological tools influence the relationship between distress and glycemic control, particularly in real-world and large-cohort contexts.

The network visualization demonstrates that diabetes distress research is advancing toward a holistic paradigm where psychological, behavioral, and biomedical constructs are closely integrated. To enhance the scientific foundation, future studies should employ multimodal designs incorporating longitudinal, interventional, and implementation research approaches, with particular attention to underrepresented populations and contexts.

Implications and Future Research Directions

The present study's findings carry important theoretical, practical, and methodological implications for the future of diabetes burnout research. The integration of keywords related to digital innovation suggests the emergence of a digital biopsychosocial model, wherein technology plays a mediating role in emotional regulation and behavioral adherence. Practically, the findings highlight the importance of multidisciplinary collaboration in addressing diabetes burnout. Psychological assessment should become an integral component of diabetes care, complemented by behavioral counseling, social support systems, and resilience training (Abdoli, Hessler, et al., 2021; Nuari, 2018). Incorporating emotional and behavioral evaluation into standard clinical protocols can enhance adherence and improve long-term outcomes (Abdoli, Miller-Bains, et al., 2021; Cyranka et al., 2024). The increasing presence of telehealth and digital monitoring in the bibliometric network also reflects a global movement toward integrated care systems that

merge medical supervision with virtual psychological support. These systems can offer personalized feedback, monitor self-care behaviors, and provide continuous emotional assistance, thereby reducing the risk of burnout and improving patient quality of life (Asadpour & Veisi, 2018; Charman, 2000; Kiriella et al., 2021) .

The dominance of cross-sectional and self-report studies limits the ability to draw causal conclusions or capture temporal changes in burnout experiences. Future research should adopt longitudinal, experimental, and mixed-method approaches that integrate both objective clinical indicators and subjective emotional metrics. The application of machine learning and network analytics could also enhance understanding by identifying hidden patterns in large-scale bibliographic or clinical datasets. Overall, the results of this study confirm and extend earlier findings while introducing new perspectives. This evidence demonstrates that diabetes burnout research has evolved into a mature interdisciplinary domain bridging medicine, psychology, and digital health. The field has shifted from viewing burnout as a marginal psychological issue to recognizing it as a central determinant of treatment success. Consequently, future research and clinical practice should adopt integrative, evidence-based, and technologically enhanced approaches that address both the emotional and physiological dimensions of living with diabetes.

Conclusion

This bibliometric analysis offers a comprehensive understanding of global research trends on diabetes burnout from January 2015 until September 2025. The findings reveal a consistent increase in scholarly attention, with 860 publications indicating a transition from clinical management toward a multidisciplinary approach that integrates psychological, behavioral, and biomedical perspectives. Three dominant research clusters were identified: psychological and behavioral dimensions, clinical and metabolic management, and self-care with digital health interventions. This pattern underscores the growing recognition of diabetes burnout as a multidimensional issue that extends beyond physiological parameters. The findings imply that healthcare professionals should implement integrated care models combining psychosocial support, behavioral guidance, and clinical supervision to improve patient outcomes. Future research should pursue longitudinal and cross-cultural investigations to clarify causal relationships and contextual variations in diabetes burnout. Overall, diabetes burnout has emerged as a critical global health concern requiring interdisciplinary and technology-driven strategies. Strengthening evidence-based interventions that promote emotional well-being and sustainable self-management will contribute to advancing holistic care and achieving SDG 3 (Good Health and Well-Being).

This bibliometric analysis contains numerous limitations. Initially, it depended exclusively on the Scopus database, which may not encompass all pertinent publications indexed in alternative databases. The study is susceptible to linguistic bias, as it exclusively analyzed English-speaking articles. Finally, although bibliometric indicators offer insights into research trends and collaboration patterns, they do not measure the quality or efficacy of empirical evidence, indicating that the findings are primarily derived from publication volume and network connections rather than the robustness of the research.

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Author Contribution and Competing Interest

All authors contributed significantly to the conception, design, analysis, and interpretation of data. Each author participated in drafting or critically revising the manuscript and approved the final version for publication. The authors declare that they have no competing interests related to the content of this manuscript.

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