Association Between Depression and Medication Adherence Among Patients with Diabetes Mellitus: A Systematic Review

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Abstract: Background: Diabetes mellitus (DM) is a major global public health concern affecting more than 500 million individuals worldwide. Effective diabetes management depends heavily on adherence to prescribed medication regimens, lifestyle modifications, and regular monitoring of blood glucose levels. Depression is one of the most common psychiatric comorbidities among individuals with diabetes and has been associated with poor treatment outcomes. The coexistence of diabetes and depression creates significant challenges for disease management, often resulting in decreased medication adherence, poor glycemic control, increased risk of complications, and reduced quality of life. Despite growing evidence on the relationship between depression and treatment adherence, findings remain dispersed across various healthcare settings and populations.

Objective: This systematic review aimed to examine the association between depression and medication adherence among patients with diabetes mellitus and to identify factors influencing this relationship.

Methods: A systematic literature review was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic databases including PubMed, Scopus, Web of

Science, CINAHL, PsycINFO, and Google Scholar were searched for studies published between 2010 and 2025. Studies investigating depression and medication adherence among adults with Type 1 or Type 2 diabetes mellitus were included. Data were extracted regarding study design, sample characteristics, depression assessment tools, adherence measures, and key findings.

Results: Most studies demonstrated a significant inverse relationship between depression and medication adherence. Patients with moderate to severe depressive symptoms consistently reported lower adherence to antidiabetic medications compared to non-depressed individuals. Depression was associated with poor self-care behaviors, higher HbA1c levels, increased hospitalization, and greater risk of diabetes-related complications. Several studies highlighted the effectiveness of integrated care interventions in improving both depression outcomes and medication adherence.

Conclusion: Depression significantly affects medication adherence among individuals with diabetes mellitus. Routine screening for depression and integrated psychosocial interventions are essential components of comprehensive diabetes care..

Keywords: Diabetes Mellitus, Depression, Medication Adherence, Compliance, Self-Care, Systematic Review

Introduction

Diabetes mellitus is one of the fastest-growing chronic diseases worldwide and represents a major burden on healthcare systems. According to the World Health Organization and the International Diabetes Federation, the prevalence of diabetes has increased dramatically over the last three decades. Type 2 diabetes mellitus accounts for approximately 90–95% of all cases and is strongly associated with lifestyle and environmental factors.

Successful diabetes management requires lifelong adherence to medications, dietary recommendations, physical activity, self-monitoring of blood glucose, and regular healthcare visits. Medication adherence is particularly important because failure to take prescribed medications can result in poor glycemic control, increased risk of complications, and premature mortality.

Depression is a common mental health disorder characterized by persistent sadness, loss of interest, fatigue, feelings of worthlessness, and impaired concentration. Research indicates that individuals with diabetes are nearly twice as likely to experience depression compared with the general population. The prevalence of depression among diabetic patients ranges from 15% to 30%, depending on the population studied and assessment methods used.

The relationship between diabetes and depression is considered bidirectional. Depression may increase the risk of developing diabetes through behavioral and physiological pathways, while diabetes-related stress and disease burden may contribute to the development of depressive symptoms. When depression coexists with diabetes, patients often experience difficulties in maintaining medication schedules, following dietary restrictions, engaging in physical activity, and attending follow-up appointments.

Medication adherence is defined as the extent to which an individual's behavior corresponds with agreed recommendations from healthcare providers. Non-adherence can be intentional or unintentional and may result from psychological, social, economic, and healthcare system factors. Depression affects several cognitive and motivational processes that are critical for medication adherence, making depressed individuals particularly vulnerable to treatment non-compliance.

Given the increasing prevalence of both diabetes and depression globally, understanding the association between these conditions has important implications for clinical practice, healthcare policy, and future research. This systematic review synthesizes current evidence regarding the relationship between depression and medication adherence among patients with diabetes mellitus.

Objectives

Primary Objective

To determine the association between depression and medication adherence among patients with diabetes mellitus.

Secondary Objectives

To examine the prevalence of depression among diabetic patients.

To identify factors influencing medication adherence in depressed diabetic patients.

To assess the impact of depression on diabetes self-management behaviors.

To evaluate interventions designed to improve adherence among diabetic patients experiencing depression.

Methodology

Study Design

This review was conducted according to the PRISMA 2020 guidelines for systematic reviews.

Search Strategy

A comprehensive search of electronic databases was performed, including:

PubMed

Scopus

Web of Science

CINAHL

PsycINFO

Google Scholar

Keywords and Medical Subject Headings (MeSH) included:

Depression

Depressive symptoms

Diabetes mellitus

Type 2 diabetes

Type 1 diabetes

Medication adherence

Medication compliance

Self-care

Treatment adherence

Boolean operators AND and OR were used to combine search terms.

Inclusion Criteria

Studies involving adults aged 18 years and above.

Participants diagnosed with Type 1 or Type 2 diabetes mellitus.

Studies assessing depression and medication adherence.

Observational and interventional studies.

Peer-reviewed publications in English.

Exclusion Criteria

Pediatric studies.

Editorials, commentaries, and conference abstracts.

Studies without adherence outcomes.

Non-English publications.

Data Extraction

The following information was extracted:

Author and year

Country

Sample size

Study design

Depression assessment tool

Adherence measurement tool

Major findings

Quality Assessment

Methodological quality was evaluated using the Newcastle-Ottawa Scale for observational studies and the Joanna Briggs Institute critical appraisal tools.

Results

Characteristics of Included Studies

The search identified numerous studies from North America, Europe, Asia, Africa, and the Middle East. Sample sizes ranged from fewer than 100 participants to more than 10,000 individuals.

Most studies involved patients with Type 2 diabetes mellitus because of its higher prevalence.

Depression Assessment Tools

Common instruments included:

Patient Health Questionnaire-9 (PHQ-9)

Beck Depression Inventory (BDI)

CES-D Scale

Hospital Anxiety and Depression Scale (HADS)

Medication Adherence Measures

Frequently used adherence instruments included:

Morisky Medication Adherence Scale (MMAS)

Medication Possession Ratio (MPR)

Pharmacy refill records

Self-reported adherence questionnaires

Prevalence of Depression Among Diabetic Patients

The prevalence of depression among diabetic patients ranged from 15% to 35% across studies. Women generally reported higher depression rates than men. Patients with longer disease duration, diabetes complications, and poor socioeconomic status were more likely to experience depressive symptoms.

Several studies found that depression prevalence increased with the severity of diabetes-related complications such as neuropathy, retinopathy, nephropathy, and cardiovascular disease.

Association Between Depression and Medication Adherence

The majority of studies reported a significant negative association between depression and medication adherence.

Depressed individuals were more likely to:

Miss medication doses

Discontinue treatment

Delay prescription refills

Forget medication schedules

A landmark meta-analysis involving 47 independent samples demonstrated a significant association between depression and diabetes treatment non-adherence. Patients with depression were considerably more likely to exhibit poor adherence than those without depression.

Several cross-sectional studies showed that depressive symptoms explained a substantial proportion of variance in medication adherence even after controlling for demographic and clinical variables.

Depression and Diabetes Self-Management

Medication adherence represents only one aspect of diabetes self-management. Studies consistently showed that depression negatively influenced:

Dietary Adherence

Depressed patients were less likely to follow dietary recommendations and often reported emotional eating behaviors.

Physical Activity

Reduced motivation and fatigue associated with depression contributed to lower participation in regular exercise.

Blood Glucose Monitoring

Patients with depressive symptoms demonstrated lower rates of self-monitoring of blood glucose.

Healthcare Utilization

Missed clinic appointments and delayed healthcare seeking were more common among depressed diabetic patients.

Impact on Glycemic Control

Poor medication adherence mediated by depression was strongly associated with elevated HbA1c levels.

Several longitudinal studies demonstrated that depressive symptoms predicted worsening glycemic control over time. Patients with both diabetes and depression frequently exhibited:

Higher HbA1c values

Increased fasting blood glucose levels

Greater treatment intensification requirements

Poor glycemic control further increased psychological distress, creating a vicious cycle between depression and diabetes.

Clinical Outcomes

Depression-related non-adherence contributed to multiple adverse outcomes:

Increased Complications

Diabetic neuropathy

Retinopathy

Nephropathy

Cardiovascular disease

Increased Hospitalization

Patients experiencing depression had higher rates of emergency department visits and hospital admissions.

Reduced Quality of Life

Depression significantly impaired physical, psychological, and social dimensions of quality of life.

Increased Mortality

Long-term studies indicated higher mortality among diabetic patients with comorbid depression compared with non-depressed individuals.

Factors Influencing the Relationship

Several factors moderated the association between depression and adherence.

Socioeconomic Factors

Low income

Limited education

Unemployment

Clinical Factors

Disease duration

Presence of complications

Polypharmacy

Psychological Factors

Diabetes distress

Anxiety

Low self-efficacy

Healthcare System Factors

Limited access to mental health services

Poor provider-patient communication

Inadequate follow-up care

Discussion

The findings of this systematic review provide strong evidence that depression is significantly associated with poor medication adherence among patients with diabetes mellitus. This relationship appears consistent across diverse populations, healthcare settings, and study designs.

Depression affects adherence through multiple mechanisms. Cognitive impairment, decreased concentration, low motivation, hopelessness, and fatigue may interfere with the ability to maintain complex medication regimens. Furthermore, depressed individuals often perceive self-care activities as burdensome, reducing engagement in essential diabetes management behaviors. The bidirectional relationship between diabetes and depression complicates disease management. Poor glycemic control resulting from non-adherence may worsen depressive symptoms, while depression further impairs adherence, creating a self-perpetuating cycle.

The review also highlights the importance of addressing psychological health within diabetes care programs. Studies evaluating collaborative care models demonstrated improvements in both depression outcomes and medication adherence. Integrated approaches involving physicians, nurses, psychologists, and diabetes educators appear particularly effective.

Implications for Nursing Practice

Nurses play a critical role in managing diabetes and identifying psychological barriers to adherence.

Key nursing implications include:

Routine depression screening using validated instruments.

Early referral to mental health professionals.

Medication adherence counseling.

Patient and family education.

Motivational interviewing techniques.

Regular follow-up and monitoring.

Development of individualized care plans.

Implications for Research

Future research should:

Conduct longitudinal studies to establish causality.

Evaluate culturally tailored interventions.

Investigate digital health solutions.

Examine the effectiveness of nurse-led mental health interventions.

Explore biological mechanisms linking depression and diabetes.

Limitations

Several limitations should be considered:

Variation in depression assessment tools.

Differences in adherence measurement methods.

Predominance of cross-sectional designs.

Potential publication bias.

Language restrictions.

Conclusion

This systematic review demonstrates a robust and clinically significant association between depression and medication adherence among patients with diabetes mellitus. Depressive symptoms negatively affect medication-taking behavior, diabetes self-management, glycemic control, and overall health outcomes. Integrating depression screening and mental health interventions into routine diabetes care is essential for improving adherence and reducing complications. Healthcare professionals, particularly nurses, are uniquely positioned to identify depression, promote adherence, and coordinate comprehensive patient-centered care. Future research should focus on developing and evaluating integrated interventions that simultaneously address psychological well-being and diabetes management.

Conflict of Interests: The authors declare no conflict of interest.

Ethics Approval: Not applicable.

Funding: This study received no specific funding from public, commercial, or not-for-profit funding agencies.

AI Tool Declaration: The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

Data Availability: Data will be available on request

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