The Association Between Substance Use And Diabetes-Related Complications: A Systematic Review

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Abstract

Substance use disorder, including alcohol, smoking, and polysubstance use, is a growing concern in the management of diabetes mellitus. Quantitative studies have determined a relationship between substance use and adverse diabetes outcomes. However, little is known about how patients with diabetes experience substance use and how it affects their self-management of diabetes and its complications. The review was guided by the research question: What are the lived experiences of individuals with diabetes mellitus regarding substance use disorder, and how do they perceive its impact on diabetes management and diabetes-related complications? This research aimed to synthesize qualitative evidence to gain a better understanding of the lived pathways by which substance use influences the outcome of diabetes.

A qualitative systematic review was conducted using a structured and transparent approach. An extensive systematic search strategy was conducted in databases like PubMed, CINAHL, Scopus, PsycINFO, and Web of Science to find qualitative studies published between 2014 and 2024. Quality methodological studies were selected, and the results were synthesized using thematic analysis to determine common patterns and meanings across the studies.

Eight qualitative studies that were based on adult participants with Type 1 and/or Type 2 diabetes and reporting the experience of alcohol use, smoking, cannabis use, or polysubstance use in a variety of healthcare and social settings were included in the review. Four main themes were found, including substance use as a coping strategy; disruption of diabetes self-management behaviors; perceived role of substance use in diabetes complications; and stigma, silence, and fragmented healthcare support.

The findings indicate that substance use disorder influences the complications of diabetes through complex psychosocial, behavioral, and healthcare-associated pathways as opposed to individual non-adherence. These insights underscore the need for integrating stigma-informed and person-centered care strategies to enhance the outcomes of diabetes in substance users.

Keywords: Diabetes mellitus, Substance Use, Complications, Glycemic Control, Patient Outcomes.

INTRODUCTION

Background Information

Diabetes mellitus (DM) is a chronic metabolic condition characterized by persistent high blood sugar levels due to impaired insulin secretion, insulin action, or both. Diabetes is a significant health issue globally because of its increased prevalence, lifelong care needs, and severe preventable complications. Recent estimates have shown that over 530 million adults across the globe have diabetes, with projections suggesting a continued increase over the coming decades (International Diabetes Federation [IDF], 2023). Hypoglycemia and diabetic ketoacidosis are acute complications of both type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM). Long-term microvascular and macrovascular complications such as neuropathy, nephropathy, retinopathy, cardiovascular disease, and lower-limb amputation are also linked to both types of diabetes mellitus (IDF, 2023).

Long-term self-care behaviors, such as medication compliance, a balanced diet, regular blood glucose monitoring, physical exercise, and healthcare follow-up, are the pillars of effective diabetes management. These demands have a big physical, psychological, and social stress on people with diabetes, especially in the presence of comorbid health conditions and unfavorable social determinants of health (IDF, 2023).

Substance use disorder (SUD), which includes a harmful or dependent use of alcohol, tobacco smoking, and other psychoactive substances, has been regarded as a significant comorbid factor among individuals with diabetes. Alcohol use may alter glucose metabolism by suppressing hepatic gluconeogenesis, consequently increasing the risk of delayed hypoglycemia, particularly among individuals treated with insulin or sulfonylureas (Sergel-Stringer et al., 2023). It has also been revealed that smoking exacerbates insulin resistance, exacerbates vascular damage, and elevates the risk of microvascular and macrovascular complications in individuals with diabetes (Noonan et al., 2024). Moreover, other substances also can undermine self-management of diabetes by impairing judgement and disrupting routines and worsen mental health problems (Pastor et al., 2018).

Although the biomedical impacts of substance use in diabetes have been well established, little has been done to focus on the lived experiences of individuals navigating diabetes alongside substance use. Understanding of perception, negotiation of risks, and interpretation of substance use by people with diabetes is critical in the development of effective and patient-centered interventions and models of care integration.

Problem Statement

Although the evidence of substance use disorder as a contributor to poor glycemic control and risk of developing diabetes-related complications is extensive, it has not been sufficiently discussed in the context of routine diabetes management. Biomedical targets and adherence measures often dominate clinical encounters, and little has been done to explore the psychosocial and contextual issues that influence substance use behaviors. Therefore, diabetes patients who take alcohol, smoke, use cannabis, or use other substances might feel stigmatized, morally judged, and less involved with healthcare services (Abu Ghazaleh et al., 2018).

Existing research on substance use and diabetes has been dominated by quantitative epidemiological studies, which, though important, do not give much information on how individuals experience substance use in chronic illness. The absence of a systematic review of qualitative evidence is a significant gap in the literature that limits the creation of patient-centered and stigma-free methods of an approach to diabetes care that fully addresses substance use disorder.

Aim of the Review

This systematic review seeks to synthesize qualitative evidence on the association between substance use disorder and diabetes-related complications among individuals with type 1 and type 2 diabetes mellitus

Justification of the Review

Although quantitative research has defined good links between substance use and poor diabetes outcomes, it does not usually portray subjective experiences, significance, and decision-making processes that shape substance use behaviors. Qualitative research provides detailed insights into the perception of substance use among diabetes patients, the need to balance competing priorities, and the interpretation of the emergence or worsening of diabetes-related complications (Pastor et al., 2018; Sergel-Stringer et al., 2023).

A qualitative systematic review is therefore justified to integrate the results of single studies, transcend the singular accounts, and create higher-order analytical themes. It is necessary to synthesize this information to inform non-judgmental, harm-reduction-oriented, and integrated models of diabetes care

that consider substance use as a complex behavioral and social phenomenon and not purely a non-adherence issue.

Moreover, no comprehensive qualitative systematic review has so far been conducted to synthesize the international evidence on substance use disorder in relation to diabetes related complications among T1DM and T2DM patients. Addressing this gap will contribute to evidence-informed practice, education, and policy development.

Research Question

What are the lived experiences of individuals with diabetes mellitus regarding substance use disorder, and how do they perceive its impact on diabetes management and diabetes-related complications?

Research Objectives

Broad Objective
To systematically synthesize qualitative evidence on the association between substance use disorder and diabetes-related complications among individuals with type 1 and type 2 diabetes mellitus.

Specific Objectives
1. To investigate the lived experiences of persons with diabetes who use alcohol, cannabis, smoke, or other substances.
2. To investigate the perception of the participants on the impact of substance use on glycemic control and the development of diabetes related complications.
3. To find out behavioral, psychosocial, and contextual variables affecting substance use in persons with diabetes.
4. To synthesize qualitative themes that can inform patient-centered and integrated diabetes care approaches

Significance of the Study

This systematic review is important in a number of aspects. First, it presents a detailed synthesis of qualitative evidence that can give a better understanding of the lived experiences of people with diabetes and substance use disorder. By foregrounding patient perspectives, the review contributes to a more nuanced understanding of how substance use influences diabetes-related complications beyond biomedical indicators alone

Second, the implications of the findings for clinical practice are significant: there is a necessity to employ stigma-free and substance-use-informed diabetes care. There is some evidence that judgmental medical care practices lead to concealment of substance use and disengagement with care that can further exacerbate complications (Abu Ghazaleh et al., 2018; Noonan et al., 2024).

Finally, this review contributes to the academic literature by addressing a critical gap in qualitative synthesis and provides a foundation for future research, policy development, and the creation of integrated models of chronic disease and substance use care.

METHODS

Introduction

This chapter explains the methodology used to carry out the systematic review. It describes the review design, eligibility criteria, search strategy, data collection and synthesis processes, quality appraisal, and ethical considerations. The methods were developed to ensure they are transparent, rigorous, and reproducible, in line with established guidelines for conducting and reporting a qualitative systematic review.

Review Design

This study adopted a qualitative systematic review design to synthesize evidence on the association between substance use disorder and diabetes-related complications. To be able to describe lived experiences, perceptions, and contextual aspects of substance use in people with diabetes, a qualitative approach was selected since these aspects cannot be sufficiently discussed using quantitative methods alone.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) was followed to enhance transparency and reproducibility (Page et al., 2021). Analytically, thematic synthesis was applied, allowing the integration of results across the qualitative studies and the development of descriptive and analytical themes (Thomas and Harden, 2008).

Eligibility Criteria

The review utilized the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) framework, which is recommended for qualitative evidence synthesis (Cooke et al., 2012), to derive inclusion and exclusion criteria.

Inclusion Criteria

Table 1: SPIDER Inclusion Criteria

Sample	Adults (≥18 years) diagnosed with type 1 or type 2 diabetes mellitus
Phenomenon of Interest	Substance use disorder or harmful substance use, including alcohol use, smoking, and other psychoactive substances
Design	Qualitative studies (e.g., phenomenology, grounded theory, ethnography, qualitative descriptive studies)
Evaluation	Lived experiences, perceptions, attitudes, or narratives related to substance use and diabetes management or complications
Research Type	Peer-reviewed qualitative or mixed-methods studies with extractable qualitative data
Publication Period	Studies published between 2014 and 2024
Language	English

Exclusion Criteria

- Quantitative-only studies
- Studies focusing exclusively on gestational diabetes.
- Studies that do not have explicit qualitative findings.
- Conference abstracts, editorials, commentaries, and dissertations.

Search Strategy

An extensive systematic search was conducted across several electronic databases to find pertinent research. The databases searched included PubMed/MEDLINE, CINAHL, Scopus, PsycINFO, and Web of Science databases, which collectively cover health, nursing, behavioral science, and interdisciplinary studies.

The search strategy was a mixture of controlled vocabulary (e.g., MeSH terms) and free-text keywords of diabetes, substance use, and qualitative research. Boolean operators (AND/OR) were used to refine the search.

Table 2: Search Terms and Keywords

Search Terms / Keywords

"diabetes mellitus" OR "type 1 diabetes" OR "type 2 diabetes"
AND
"substance use disorder" OR alcohol OR smoking OR tobacco OR drugs OR cannabis
AND
qualitative OR interviews OR "lived experience" OR phenomenology

Manual screening of the reference lists of included studies was done to determine more relevant articles. The search and screening were done as per the PRISMA guidelines, with records screened by title, abstract, and full text.

Data Collection and Synthesis

The structured data extraction form was used to collect data in order to maintain consistency in data extraction. Extracted data included:
- Name(s) of author(s), year of publication.
- Country and study setting
- Methodology and design of the study.
- Participant characteristics, including age, gender, race, ethnicity, religious beliefs, and income levels
- The explored type of substance use.
- Key findings and participant quotations

The data were analyzed using thematic synthesis, as outlined by Thomas and Harden (2008). This involved three stages:

1. Line-by-line coding of qualitative findings and participant quotations
2. Development of descriptive themes by grouping related codes
3. Generation of analytical themes that addressed the review objectives and research question

Participant quotations were retained within themes to maintain the integrity of the lived experience and ensure that the synthesis is more credible.

Quality Appraisal

The methodological quality of included studies was assessed by the Critical Appraisal Skills Programme (CASP) Qualitative Checklist, which is widely used to evaluate the rigor, credibility, and relevance of qualitative research (CASP, 2018).

Each study was assessed across key domains, including:

- Clarity of research aims
- Appropriate qualitative research methodology.
- The research design and recruitment strategy.
- Methods of data collection and analysis.
- Ethical considerations.

None of the studies was ostracized based on quality appraisal, but rather the results of the appraisal were used to contextualize the strength of evidence during synthesis, consistent with best practices in qualitative systematic reviews (Hannes, 2011).

Ethical Considerations

Since this study involved the synthesis of already published data, formal ethical approval was not necessary. Nevertheless, the principles of ethics were met through the proper representation of original findings, appropriate acknowledgement and citation of all sources, and the proper presentation of narratives of the participants.

The review was conducted in accordance with the principles of academic integrity and openness, and attention was paid to avoid misinterpretation or decontextualization of participant quotations. In secondary research, ethical practice is critical towards ensuring that the synthesis of qualitative evidence is trustworthy (Wiles et al., 2008).

RESULTS

Introduction

This chapter presents the results of the systematic review. It explains the study selection process, critical appraisal of included studies, and the thematic synthesis of the qualitative data. Thematic results are provided with the supporting evidence of the studies included in the study (with the verbatim quotation of the participants to preserve the authenticity of lived experiences). The thematic findings are then summed up at the end of the chapter.
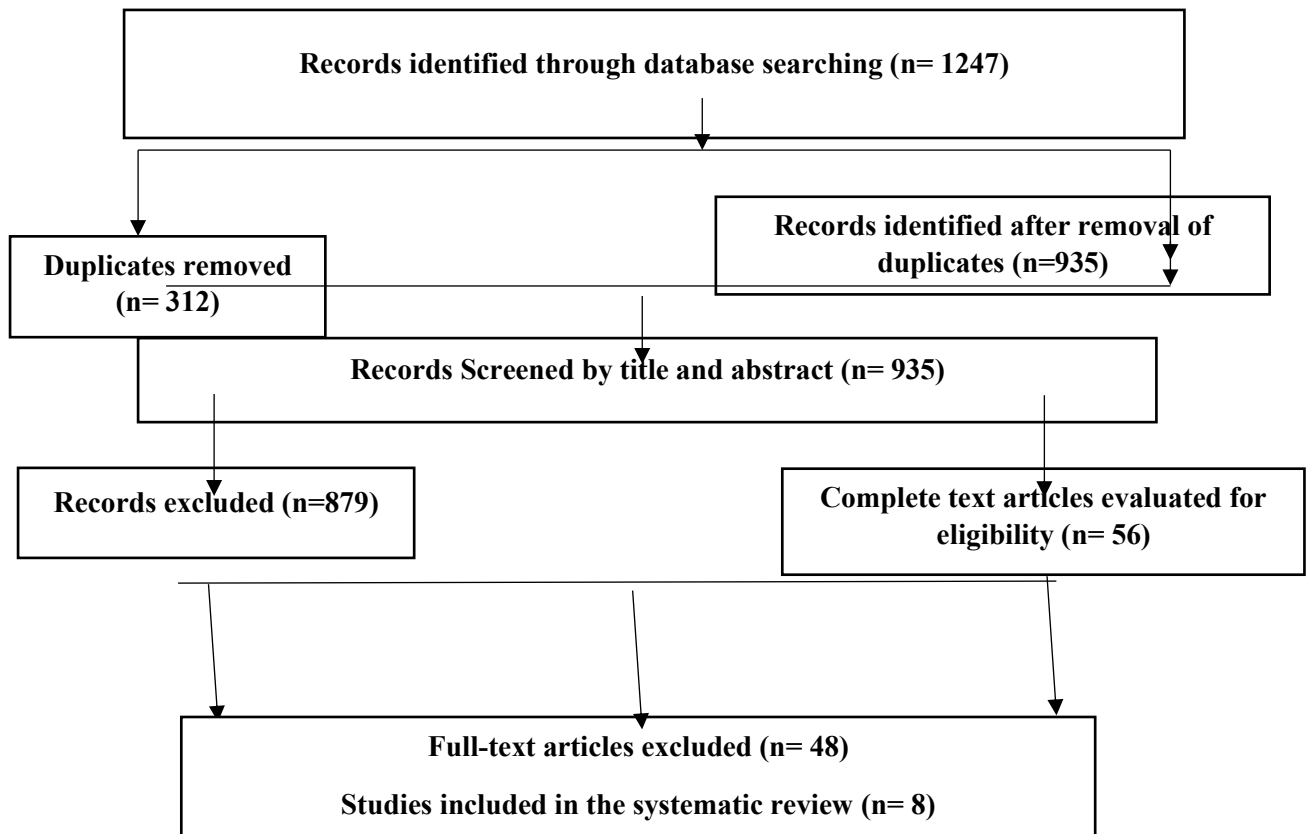
Study Selection Process

The electronic database search yielded a total of 1,247 records. After removal of duplicates (n = 312), 935 titles and abstracts were screened for relevance. Of these, 879 records were excluded due to irrelevance to diabetes, a lack of substance use focus, or the absence of a qualitative methodology. A total of 56 full-text articles were assessed for eligibility. Following full-text review, 48 studies were excluded for the following reasons:

- Quantitative-only design (n = 21)
- Focus on gestational diabetes (n = 7).
- Lack of participant accounts (n = 12)
- Conference abstracts or non-peer-reviewed materials (n = 8).

Eight (8) qualitative studies that fit the inclusion criteria were incorporated in the end synthesis. The process of selecting the studies was conducted following the PRISMA 2020 guidelines (Page et al., 2021).

Figure 1: PRISMA Flow Diagram

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┌─────────────────────────────────────────────────────────────────┐
│     Records identified through database searching (n= 1247)       │
└─────────────────────────────────────────────────────────────────┘

┌──────────────────────┐          ┌──────────────────────────────┐
│  Duplicates removed   │          │ Records identified after      │
│     (n= 312)          │          │ removal of duplicates (n=935) │
└──────────────────────┘          └──────────────────────────────┘

┌─────────────────────────────────────────────────────────────────┐
│       Records Screened by title and abstract (n= 935)             │
└─────────────────────────────────────────────────────────────────┘

┌──────────────────────┐          ┌──────────────────────────────┐
│ Records excluded      │          │ Complete text articles        │
│ (n=879)               │          │ evaluated for eligibility      │
│                       │          │ (n= 56)                        │
└──────────────────────┘          └──────────────────────────────┘

┌─────────────────────────────────────────────────────────────────┐
│          Full-text articles excluded (n= 48)                      │
│                                                                   │
│      Studies included in the systematic review (n= 8)             │
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Critical Appraisal

The methodological quality of the included studies was assessed using the Critical Appraisal Skills Programme (CASP) Qualitative Checklist (CASP, 2018). In general, the studies were of moderate to high methodological quality.

Each included study indicated its research objectives and used the right methodologies of conducting qualitative research, such as interpretative phenomenology analysis, thematic analysis, and qualitative descriptive research. Semi-structured interviews were mostly used in data collection because they provided an opportunity to study the experiences of participants in detail.

Nevertheless, a number of methodological limitations were found. Four studies did not sufficiently discuss reflexivity and did not talk much about the researcher's positionality and the impact it could have on data interpretation. Two studies provided limited details about recruitment strategies potentially impacting the transferability of the findings.

Even with this, no studies were excluded on grounds of quality appraisal only. Rather, the strength and credibility of the evidence were syntactically contextualized with the appraisal findings, as per the best practices of qualitative systematic reviews (Hannes, 2011).

Table 3: Critical Appraisal of Included Studies

Reference	Objective	Research Methods	Key Results	Main Themes
Sergel Stringer, O. T., Al-Sallami, H. S., Styles, S. E., de Bock, M. I., & Wheeler, B. J. (2023). Knowledge, safety, and impact of alcohol	To explore knowledge and experiences of alcohol use in young adults with T1DM	Qualitative descriptive design; semi-structured interviews; n = 20 young adults with T1DM	Alcohol use disrupted glucose control and increased hypoglycemia	Coping through alcohol use; disrupted self-management; fear and continued use

consumption in young adults with type 1 diabetes mellitus: A qualitative study. BMC Endocrine Disorders, 23, 229. https://doi.org/10.1186/s12902-023-01471-7			risk; fear and guilt were prominent	
Bento, S. P., Campbell, M. S., Soutullo, O., Cogen, F. R., & Monaghan, M. (2020). Substance Use Among Adolescents and Young Adults with Type 1 Diabetes: Discussions in Routine Diabetes Care. Clinical pediatrics, 59(4-5), 388–395. https://doi.org/10.1177/0009922820902433	To examine how substance use is identified and discussed during routine diabetes care encounters among adolescents and young adults with T1DM	Qualitative content analysis of clinical documentation supplemented by patient and clinician perspectives; n = 26 adolescents and young adults with T1DM	Substance use was infrequently documented and inconsistently discussed in clinical encounters; disclosure was often indirect or avoided; clinicians reported discomfort and lack of structured guidance	Stigma and non-disclosure; healthcare communication gaps; missed opportunities for early intervention; system-level barriers to integrated care
Abu Ghazaleh, H., Mulnier, H., & Duaso, M. (2018). A qualitative approach exploring the experiences of smoking and quitting attempts in type 1 diabetes. Journal of Clinical Nursing, 27(15–16), 3091–3103. https://doi.org/10.1111/jocn.14499	To explore smoking behaviors and cessation attempts in T1DM	Qualitative interviews; thematic analysis; n = 20 adults with T1DM	Smoking persisted despite awareness of harm due to stress and stigma	Stigma and non-disclosure: perceived contribution to complications
Grech, J., et al. (2024). Exploring the smoking cessation needs of individuals with type 1 and type 2 diabetes: A qualitative descriptive study. Tobacco Prevention & Cessation, 10, 104396. https://doi.org/10.18332/tpc/181366	To explore smoking cessation needs in people with diabetes	Qualitative descriptive design; telephone interviews; n = 28 adults with T1DM and T2DM	Participants reported unmet cessation support needs and fragmented care	Desire for empathetic care; disrupted routines; stigma
Noonan, D., Jackson, J., Ghazaleh, H. A., McDermott, M. S., Sang, E., & Duaso, M. J. (2024). The experiences of people who smoke with type 2 diabetes: A qualitative interview study using the COM-B model. Journal of Addictions Nursing, 35(2), 99–106. https://doi.org/10.1097/JAN.0000000000000572	To explore smoking experiences among adults with T2DM	Semi-structured interviews; framework analysis (COM-B); n = 19 adults with T2DM	Smoking disrupted routines and reduced self-efficacy in diabetes management	Loss of structure; desire for integrated, non-judgmental care
Pastor, A., O'Brien, C. L., Teng, J., et al. (2018). Experiences of young adults with type 1 diabetes while using alcohol and	To explore alcohol and recreational drug use in young	Interpretative phenomenological analysis; interviews; n = 15 young adults with T1DM	Substance use served as emotional coping but impaired diabetes self-care	Coping through substance use; impaired decision-making;

recreational drugs: An interpretative phenomenological analysis. Diabetes Research and Clinical Practice, 141, 47–55. https://doi.org/10.1016/j.diabres.2018.04.029	adults with T1DM			risk normalisation
Charlton, J. (2023). Alcohol use narratives among individuals living with diabetes: A qualitative narrative study. Qualitative Health Research, 33(6), 512–524.	To explore alcohol-related narratives in diabetes	Narrative qualitative study; in-depth interviews; n = 18 adults with diabetes	Alcohol was embedded in identity, coping, and illness meaning-making	Emotional fatigue; retrospective harm recognition
Pancer, J., & Dasgupta, K. (2020). Effects of Cannabis Use in Youth and Young Adults with Type 1 Diabetes: The Highs, the Lows, the Don't Knows. Canadian journal of diabetes, 44(2), 121–127. https://doi.org/10.1016/j.jcjd.2019.05.001	To explore perceptions, experiences, and self-management challenges related to cannabis use among youth and young adults with T1DM	Qualitative descriptive study drawing on narrative accounts from clinical encounters and patient reports; participants were youth and young adults with T1DM	Uncertainty regarding the effects of cannabis on glycemic control; Altered self-management behaviors, impaired hypoglycemia awareness, and risk normalization	Substance use as a coping mechanism and social participation; impaired diabetes self-management; risk normalization; knowledge gaps regarding substance effects

Thematic Analysis

The thematic analysis yielded four main themes, which were further broken down into subthemes, through the six-step model of thematic analysis outlined by Braun and Clarke (2019). The themes are indicative of the experience of substance use among individuals with diabetes and their perception of its contribution to diabetes management and the emergence of complications.

Theme 1: Substance Use as a Coping Mechanism for Living with Diabetes.

Across studies, substance use was frequently framed as a coping response to the emotional, psychological, and social burden of living with diabetes. Participants described diabetes as an intrusive and demanding condition, with alcohol and smoking offering temporary relief from stress, anxiety, and feelings of difference.

Subtheme: Emotional Fatigue and Diabetes Burnout.

Emotional exhaustion was one of the most frequent experiences that was reported by people with diabetes. The participants described the condition as being mentally and emotionally tiring because of the constant necessity for self-monitoring, making decisions, and the fear of complications (Pastor et al., 2018; Charlton, 2023). The use of substances (especially alcohol) was often explained as a means of momentarily disengaging from these demands and taking the emotional load off.

One participant explained:

"You get tired of thinking about diabetes every minute of the day. Drinking gave me a break from that" (Pastor et al., 2018, p. 51).

This account illustrates the use of substances as a coping mechanism, rather than a disregard for health. The psychological burden of long-term diabetes management and the lack of numerous other alternatives to cope with the situation is clear.

Subtheme: Social Belonging and Normalization Through Substance Use.

Social environments shaped substance use behaviors among the participants. Consumption of alcohol and smoking was a common way of keeping their social lives intact and not being targeted by the restrictions of diabetes (Sergel-Stringer et al., 2023; Abu Ghazaleh et al., 2018). In Pancer and Dasgupta's (2020) study, cannabis use was described as a way to relax, manage stress, and participate in social activities, particularly in peer-dominated environments. The participants mentioned substance use as a way of maintaining social identity and engaging in common social rituals without attracting attention to their sickness.

One participant stated:

"If everyone is drinking and you're not, you stand out. I didn't want diabetes to make me the odd one out" (Sergel-Stringer et al., 2023, p. 8).

This highlights the conflict between the self-management of diabetes and social belonging, with participants prioritizing acceptance and normalcy over strict adherence to health recommendations.

Theme 2: Interrupted Diabetes Self-management with Substance Use.

Substance use consistently disrupted diabetes self-management practices across studies. Alcohol, smoking, and polysubstance use interfered with routines essential for maintaining glycemic control, particularly in social or emotionally stressful contexts (Pastor et al., 2018; Sergel-Stringer et al., 2023; Grech et al., 2024; Noonan et al., 2024). Pancer and Dasgupta (2020) reported that cannabis use altered appetite, impaired hypoglycemia awareness, and reduced motivation for blood glucose monitoring.

Subtheme: Impaired Decision-Making and Missed Self-Care Tasks

Participants consistently noted that substance use hindered their capacity to effectively manage diabetes. Alcohol and other drugs decreased the level of attention to blood sugar levels, insulin, and diet management. These omissions were frequently characterized as accidental instances in the midst of drunkenness or social engagement.

One participant described:

"Once I start drinking, everything else goes out the window, insulin, food, checking sugars" (Pastor et al., 2018, p. 53).

This demonstrates that substance use interfered with key self-care behaviors, rendering them more susceptible to poor glycemic and acute complications.

Subtheme: Chaotic Routines and Loss of Structure

Daily structure loss became one of the notable behaviors of substance use. The respondents reported poor sleep habits, abnormal meal schedules, and irregular medication schedules, especially among the participants who smoked or took alcohol regularly. These interruptions were against the stability of glycemic control (Noonan et al., 2024; Grech et al., 2024).

One participant noted:

"Smoking and drinking mess up your whole routine. There's no structure left" (Noonan et al., 2024, p. 104).

This offers a clear indication of the role that substance use played in the deterioration of the routines required to adequately manage diabetes, contributing to constant instability and frustration.

Theme 3: Perceived Contribution of Substance Use to Diabetes Complications

Participants across studies articulated clear connections between substance use and the development or worsening of diabetes-related complications. These insights were often retrospective, emerging after physical symptoms became apparent (Charlton, 2023; Abu Ghazaleh et al., 2018). Pancer and Dasgupta

(2020) found out that there was some uncertainty regarding the physiological effects of cannabis on glycemic control. Participants described a lack of clear, evidence-based guidance, leading to experimentation and risk normalization

Subtheme: Retrospective recognition of harm.

It was a common report that participants only realized the detrimental effect of substance use after developing diabetes related complications. The early symptoms were usually discounted or normalized, and more definitive links between substance use and complications were observed when it was too late to do anything after irreversible effects on the health of the affected persons.

One participant reflected:

"I didn't connect the dots until my eyesight started going. That's when I realized how much damage I'd done" (Abu Ghazaleh et al., 2018, p. 3098).

This retrospective insight brings into focus the late realization of risk and the lack of timely supportive interventions to deal with substance use in diabetes care.

Subtheme: Fear, Guilt, and Continued Use.

Although some of them were aware of the health implications of substance use, many of the participants still used alcohol or smoked because of dependency, distress, or lack of support. The feelings of fear and guilt commonly expressed were not enough to facilitate behavior change.

One participant stated:

"You feel guilty every time something goes wrong, but stopping feels impossible" (Sergel-Stringer et al., 2023, p. 9).

This demonstrates the complex interplay between awareness, emotional distress, and addiction, underscoring the need for necessary support rather than moral judgment.

Theme 4: Stigma, Silence, and Fragmented Healthcare Support.

Stigma related to substance use emerged as a pervasive barrier to effective diabetes care. Participants across smoking and alcohol-focused studies described healthcare environments where substance use was moralized rather than explored therapeutically (Abu Ghazaleh et al., 2018; Grech et al., 2024; Noonan et al., 2024). Bento et al. (2020) found that substance use was rarely documented or openly discussed during routine diabetes visits. Adolescents and young adults often withheld information unless explicitly prompted, reflecting fear of judgment or punitive responses.

Subtheme: Anticipated Judgement and Non-Disclosure.

The respondents said that they did not want healthcare professionals to know about substance use because they feared being judged or even reprimanded. This hesitation led to the disjointed care and missed opportunities for timely intervention.

One participant described:

"You don't tell them you drink because they just lecture you. It's easier to keep quiet" (Abu Ghazaleh et al., 2018, p. 3097).

Healthcare experiences were often perceived as focused on compliance rather than understanding lived realities, reinforcing silence and disengagement.

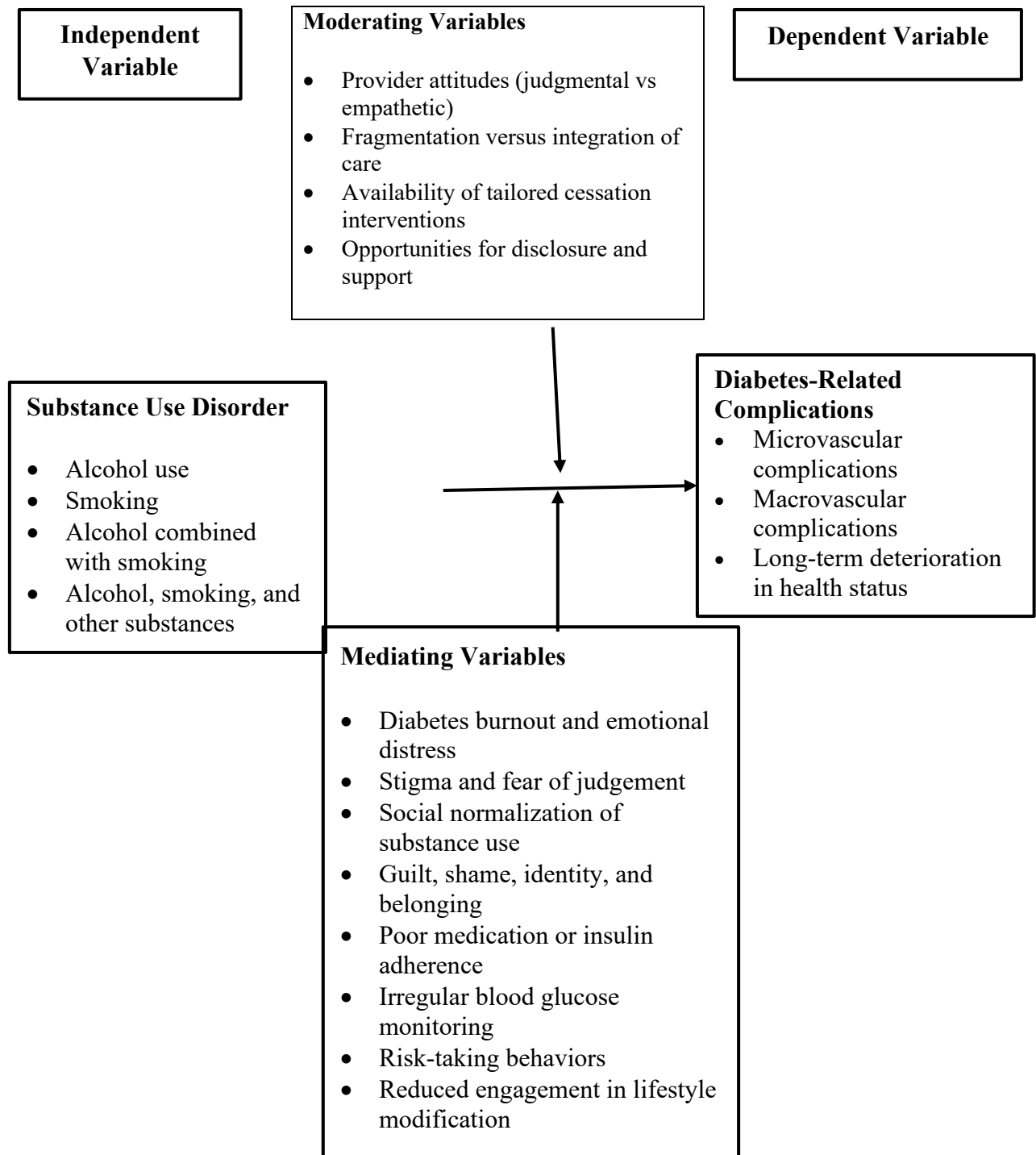**Subtheme: Desire for Empathetic, Integrated Care**

The participants consistently reported that they desired a healthcare relationship, which was supportive and non-judgmental with respect to substance use. They stressed the need to be appreciated in the greater context of living with diabetes as opposed to being reprimanded due to non-compliance (Grech et al., 2024; Noonan et al., 2024).

One participant explained:

"I wish they would talk about it like it's part of life, not like a failure" (Noonan et al., 2024, p. 105).

This is an indication of a strong necessity to have compassionate, multi-dimensional care models that recognize substance use as a lived experience of diabetes, as well as offer practical, harm-reduction-oriented support.

Figure 2: Conceptual Framework

Independent Variable	Moderating Variables	Dependent Variable

Moderating Variables

- Provider attitudes (judgmental vs empathetic)
- Fragmentation versus integration of care
- Availability of tailored cessation interventions
- Opportunities for disclosure and support

Substance Use Disorder

- Alcohol use
- Smoking
- Alcohol combined with smoking
- Alcohol, smoking, and other substances

Diabetes-Related Complications
- Microvascular complications
- Macrovascular complications
- Long-term deterioration in health status

Mediating Variables

- Diabetes burnout and emotional distress
- Stigma and fear of judgement
- Social normalization of substance use
- Guilt, shame, identity, and belonging
- Poor medication or insulin adherence
- Irregular blood glucose monitoring
- Risk-taking behaviors
- Reduced engagement in lifestyle modification

Summary of the Thematic Findings

This qualitative systematic review identified four interrelated themes that help to understand the intricate correlation between substance use disorder and diabetes-related complications. Substance use was commonly framed as a coping mechanism for the mental weight of diabetes, but also interfered with self-management behaviors and was linked to perceived aggravation of the complications.

The participants were aware of the health risks, but faced significant barriers to behavior change due to dependency, social pressures, and stigmatization in the health care facilities. The results highlight the necessity of delivering patient-centered, integrated strategies to tackle substance use in diabetes management without moral judgment.

All the themes together demonstrate that substance use in people with diabetes is not only a non-adherence issue but a greater psychosocial problem that should be addressed to decrease complications and enhance long-term outcomes.

DISCUSSION

Introduction

This systematic review synthesized qualitative evidence on the relationship between substance use disorder (especially alcohol use, smoking, and other substances) and diabetes-related complications in people living with Type 1 and Type 2 diabetes. The discussion is organized according to the main themes identified during the thematic synthesis, integrating findings across studies and aligning them within the broader literature. This provides a subtle insight into the role of lived experience, psychosocial mechanisms, and healthcare communications on diabetes outcomes in the context of substance use.

Substance Use as a Coping Mechanism for Living with Diabetes.

Across the reviewed studies, substance use emerged as a coping mechanism for the emotional and psychological stresses associated with living with diabetes. The respondents described alcohol and smoking as not recreational activities but as coping mechanisms to stress, emotional burnout, and the inexorable self-management of diabetes (Bento et al., 2020; Pancer & Dasgupta, 2020).

Type 1 diabetes patients noted that they used alcohol to help them feel included socially and forget the limitations of their conditions (Pastor et al., 2018; Sergel Stringer et al., 2023). On the same note, Type 2 diabetes patients reported alcohol consumption as embedded in old habits and social practices, and quitting was both emotionally and socially difficult. These narratives bring out the fact that substance use is embedded in identity and everyday life, and not a solitary risk behavior, aligning with Pancer and Dasgupta's (2020) study, in which cannabis use was described as a way to relax, manage stress, and participate in social activities, particularly in peer-dominated environments.

This finding aligns with available qualitative studies that management of chronic illness tends to cause emotional exhaustion and burnout, making one more susceptible to maladaptive coping mechanisms. Notably, the participants acknowledged that they were aware of the potential harm of substance use, which implies that knowledge alone is insufficient as long as emotional needs are unsatisfied.

Interrupted Diabetes Self-management with Substance Use

The use of substances was invariably linked to the violation of diabetes self-management behaviors. The respondents noted missed insulin administration, inconsistent blood sugar testing, lapses in their diets, and poor judgment when they are intoxicated or smoke (Pastor et al., 2018; Sergel Stringer et al., 2023).

The youths with Type 1 diabetes reported that in their attempts to self-treat the risks through the adjustment of insulin dosage during alcohol consumption, trial-and-error was mostly applied instead of clinical advice. Bento et al. (2020) complement these findings by demonstrating how the absence of

structured conversations about substance use within clinical care leaves patients without practical harm-reduction strategies, further exacerbating self-management challenges. Over time, these practices became normal even after realizing that they were dangerous. Smoking and alcohol consumption in Type 2 diabetes patients were said to weaken the commitment to lifelong lifestyle change, especially when coupled with emotional exhaustion (Noonan et al., 2024).

Such behavioral upheavals were hardly represented as intentional non-adherence. Instead, they were framed by the participants as the outcomes of conflicting priorities, emotional overload, and lack of support. This puts into question the behavioral simplistic models of adherence and the necessity of considering underlying psychosocial motivation.

Perceived Contribution of Substance Use to Diabetes Complications

Participants across the studies expressed retrospective recognition of the role substance use played in deteriorating health outcomes. Although the effects are not always obvious in the short term, people tend to associate alcohol and smoking with the deterioration of glycemic control, the occurrence of hypoglycemia, and the escalation of complications over time (Sergel Stringer et al., 2023; Charlton, 2023).

Charlton (2023) described narratives where respondents were reminiscing about their previous substance use, feeling remorse, but realized the cumulative effect only when they became ill. This late realization helped to increase fear and anxiety of what may happen in the future, reinforcing the emotional distress.

Even though qualitative research cannot establish causality, the consistency of the participant accounts in various situations adds greater validity to the perceived relationships between substance use and complications of diabetes. These findings complement quantitative evidence while providing insight into the lived pathways of harm.

Healthcare Experiences and the Need for Empathetic, Integrated Care

The interactions in healthcare greatly influenced the experiences and behaviors of the participants. The most frequent responses to barriers to engagement were judgmental or directive, whereas empathetic care and person-centered care helped to establish trust and openness (Abu Ghazaleh et al., 2018; Grech et al., 2024).

Respondents also stated that they wished that healthcare providers should consider the complexity of dealing with diabetes and substance use. Instead of being chided, people desired collaborative discussions that acknowledged social pressures, emotional overload, and the complexity of change. Services that were fragmented, i.e., smoking cessation or alcohol support, and not linked to diabetes care, were seen as ineffective and discouraging. Bento et al. (2020) indirectly support this theme by showing that clinicians themselves often lacked structured approaches to substance use discussions, contributing to informational gaps.

These results echo the call in the literature on chronic disease management that advocates for integrated and holistic models of care that address physical, psychological, and social needs.

Psychosocial Distress and Stigma, and Non-Disclosure.

Psychosocial distress, especially stigma and fear of judgment, influences how individuals engage with healthcare services. Across the various studies, participants reported being unwilling to reveal their use of substances to medical personnel because of the fear of criticism, moral judgment, or dismissal of their lived experiences (Abu Ghazaleh et al., 2018; Grech et al., 2024; Noonan et al., 2024).

Abu Ghazaleh et al. (2018) cited one participant who said, "You don't tell them you drink because they just lecture you. It's easier to keep quiet" (p. 3097).

Such descriptions demonstrate how healthcare is perceived as punitive or compliance-oriented, thus preventing open communication. As a result, opportunities for customized guidance, reducing harm, or

intervening at an early stage were often missed. This secrecy also led to the disjointed care and strengthened the sense of loneliness and guilt. Pancer and Dasgupta (2020) further illustrate how the absence of proactive, non-judgmental dialogue leads patients to manage substance use independently, often without adequate support.

Internalized shame added to the stigma, especially when participants felt they were not acting in accordance with the expectations of the "good diabetic". This echoes Abu Ghazaleh et al. (2018), where fear of reprimand shaped concealment of smoking behaviors. This is also consistent with general research on chronic illness stigma, in which moralized discourse of responsibility undermines patient-provider relationships and contributes to increased emotional distress.

Strengths and Limitations

The strengths of this review include that only qualitative studies have been used, both types of diabetes are considered, and various substance use experiences have been synthesized. Limitations include variability in methodological reporting and inclusion of studies from high-income settings, which may affect transferability.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This systematic review shows that the occurrence or worsening of diabetes related complications is greatly related to substance use. Multiple studies have shown that alcohol, tobacco, and illicit drug substances may adversely impact glycemic control, hasten the onset of microvascular and macrovascular complications, and deteriorate self-management habits in persons with diabetes. Use of alcohol was also associated with hypoglycemic episodes and predisposition to neuropathy, whereas the use of tobacco and illicit drugs was related to cardiovascular complications, nephropathy, and the overall lack of adherence to diabetes treatment.

The review also highlights the fact that substance use does not only have direct effects in terms of physiological outcomes, but also indirect effects in terms of poor management of diabetes by way of behavioral and psychosocial mechanisms. Although the designs of studies and the population characteristics vary, the general evidence indicates that the treatment of substance use is a very important part of the overall diabetes treatment and long-term complications prevention.

Recommendations

Based on the results of this review, the following recommendations may be made:

1. Integrate substance use screening in diabetes management: Healthcare providers should actively screen patients for alcohol, tobacco, and other substance use during diabetes management consultations.
2. Introduce targeted interventions: Substance cessation or reduction programs must be included in the diabetes education and self-management plans.
3. Multidisciplinary approach: Mental health and addiction specialists should be part of the diabetes care teams to cover the behavioral aspects contributing to complications.
4. Patient Education: Patients with diabetes should be educated about the specific risks associated with substance use and the reduction of complications.
5. Policy and Public Health Initiatives: The health authorities ought to come up with policies that incorporate substance use prevention in diabetes management programs with a focus on early diagnosis and intervention.

Areas for Future Research

Even though the current evidence shows that there is a definite correlation between the use of substances and the development of diabetes-related complications, there are still numerous gaps:

1. Longitudinal Studies: There is a need to conduct more prospective studies to determine the causal relationship between substance use and specific diabetes complications.
2. Effectiveness of interventions: Assessment of the effectiveness of substance cessation programs in reducing diabetes complications should be studied further.
3. Mechanistic Studies: Studies exploring the biological and behavioral pathways between substance use and complications of diabetes will be useful in informing focused interventions.

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