

# World Journal of *Clinical Cases*

*World J Clin Cases* 2023 December 26; 11(36): 8434-8605



## Contents

Thrice Monthly Volume 11 Number 36 December 26, 2023

## EDITORIAL

- 8434 Post-trans-arterial chemoembolization hepatic necrosis and biliary stenosis: Clinical characteristics and endoscopic approach

*Cocca S, Carloni L, Marocchi M, Grande G, Bianchini M, Colecchia A, Conigliaro R, Bertani H*

## MINIREVIEWS

- 8440 Perioperative nursing care for hip arthroplasty patients with concomitant hypertension: A minireview

*Ji CY, Yang LR*

## ORIGINAL ARTICLE

## Retrospective Study

- 8447 Evaluation of response to gemcitabine plus cisplatin-based chemotherapy using positron emission computed tomography for metastatic bladder cancer

*Öztürk H, Karapolat İ*

- 8458 Functional magnetic resonance imaging study of group independent components underpinning item responses to paranoid-depressive scale

*Stoyanov D, Paunova R, Dichev J, Kandilarova S, Khorev V, Kurkin S*

## EVIDENCE-BASED MEDICINE

- 8475 Mendelian randomization provides evidence for a causal effect of serum insulin-like growth factor family concentration on risk of atrial fibrillation

*Lin S, Tang J, Li X, Wu G, Lin YF, Li YF*

## SYSTEMATIC REVIEWS

- 8486 Significance of fostering the mental health of patients with diabetes through critical time intervention

*Eseadi C, Amedu AN, Aloh HE*

## META-ANALYSIS

- 8498 Impact of angiotensin-converting enzyme inhibitors or angiotensin receptor blockers on the mortality in sepsis: A meta-analysis

*Yang DC, Xu J, Jian L, Yu Y*

## CASE REPORT

- 8507 Multiple sparganosis spinal infections mainly in the thoracic region: A case report

*Wen GJ, Chen J, Zhang SF, Zhou ZS, Jiao GL*

- 8512** Iatrogenic flexor tendon rupture caused by misdiagnosing sarcoidosis-related flexor tendon contracture as tenosynovitis: A case report  
*Yan R, Zhang Z, Wu L, Wu ZP, Yan HD*
- 8519** Cholecystoenteric fistula in a patient with advanced gallbladder cancer: A case report and review of literature  
*Wang CY, Chiu SH, Chang WC, Ho MH, Chang PY*
- 8527** Intraperitoneal hyaline vascular Castleman disease: Three case reports  
*Gao JW, Shi ZY, Zhu ZB, Xu XR, Chen W*
- 8535** Iris metastasis from clear cell renal cell carcinoma: A case report  
*Wang TT, Chen XY, Min QY, Han YZ, Zhao HF*
- 8542** Spinal cord infarction attributed to SARS-CoV-2, with post-acute sequelae of COVID-19: A case report  
*Oleson CV, Olsen AC, Shermon S*
- 8551** Spontaneous gastric hematoma as a rare cause of acute abdomen: A case report  
*Budimir I, Žulec M, Eljuga K, Židak M, Lisek V*
- 8557** LiNA OperaScope™ for microwave endometrial ablation for endometrial polyps with heavy menstrual bleeding: A case report  
*Kakinuma K, Kakinuma T, Ueyama K, Shinohara T, Okamoto R, Yanagida K, Takeshima N, Ohwada M*
- 8563** Colonoscopy-induced acute appendicitis: A case report  
*Song XL, Ma JY, Zhang ZG*
- 8568** Post-laparotomy heterotopic ossification of the xiphoid process: A case report  
*Lee SS*
- 8574** Balloon displacement during caesarean section with pernicious placenta previa: A case report  
*Gu DF, Deng C*
- 8581** Synchronous carotid endarterectomy and coronary artery bypass graft: Four case reports  
*AlGhamdi FK, Altoijry A, AlQahtani A, Aldossary MY, AlSheikh SO, Iqbal K, Alayadhi WA*
- 8589** Intraoperative cardiogenic shock induced by refractory coronary artery spasm in a patient with myasthenia gravis: A case report  
*Hsu CW, Chang CC, Lin CS*
- 8595** Effects of video game-based therapy in an adolescent with cerebral palsy: A case report  
*Mohd Iqbal HA, Ho WS, Zanudin A, Hisham H, Mohd Nordin NA*

**LETTER TO THE EDITOR**

- 8603** Lyophilized recombinant human brain natriuretic peptide: A promising therapy in patients with chronic heart failure  
*Kourek C, Briasoulis A, Giamouzis G, Skoularigis J, Xanthopoulos A*

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**RESPONSIBLE EDITORS FOR THIS ISSUE**

Production Editor: Zi-Hang Xu, Production Department Director: Xiang Li, Editorial Office Director: Jin-Lei Wang.

**NAME OF JOURNAL**

*World Journal of Clinical Cases*

**ISSN**

ISSN 2307-8960 (online)

**LAUNCH DATE**

April 16, 2013

**FREQUENCY**

Thrice Monthly

**EDITORS-IN-CHIEF**

Bao-Gan Peng, Salim Surani, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

**PUBLICATION DATE**

December 26, 2023

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**ARTICLE PROCESSING CHARGE**

<https://www.wjgnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjgnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>



## Significance of fostering the mental health of patients with diabetes through critical time intervention

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**Specialty type:** Medicine, research and experimental

**Provenance and peer review:** Invited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0  
Grade B (Very good): B  
Grade C (Good): 0  
Grade D (Fair): D  
Grade E (Poor): 0

**P-Reviewer:** Qureshi W, India; Setiawati Y, Indonesia

**Received:** October 18, 2023

**Peer-review started:** October 18, 2023

**First decision:** November 2, 2023

**Revised:** November 23, 2023

**Accepted:** December 12, 2023

**Article in press:** December 12, 2023

**Published online:** December 26, 2023



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### Abstract

#### BACKGROUND

Critical time intervention (CTI) is an evidence-based model of practice that is time-limited and aims to provide support for most susceptible individuals during a transition period.

#### AIM

To examine the significance of fostering the mental health of diabetes patients through CTI using the scoping review methodology.

#### METHODS

As part of the scoping review process, we followed the guidelines established by the Joanna Briggs Institute. The search databases were Google Scholar, PubMed, Scopus, PsycINFO, Reference Citation Analysis (<https://www.referencecitation-analysis.com/>), and Cochrane Library. From these databases, 77 articles were retrieved with the aid of carefully selected search terms. However, 19 studies were selected after two reviewers appraised the full texts to ensure that they are all eligible for inclusion, while 54 papers were excluded.

#### RESULTS

This study revealed that diabetic patients who had experienced homelessness were at higher risk of being diagnosed with mental illness and that social support services are impactful in the management of the comorbidity of diabetes and mental health problems. In addition, this review reveals that CTI is impactful in enhancing the mental health of homeless patients during the transitional period from the hospital through social support services.

#### CONCLUSION

CTI is a promising intervention for alleviating mental health symptoms in homeless patients. Empirical studies are needed across the globe, involving both hospitalized and community-based patients, to determine how clinically effectively CTI is in managing the mental health of diabetics.

**Key Words:** Comorbidity; Critical time intervention; Diabetes; Homeless patients; Mental illness

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**Core Tip:** Evidence suggests that diabetic patients who have experienced homelessness are at higher risk of being diagnosed with mental illness, and that social support services are impactful in the management of the comorbidity of diabetes and mental health problems. Studies on the effectiveness of critical time intervention (CTI) among patients with diabetes are limited. Available studies have shown that CTI is a promising intervention for alleviating mental health symptoms in homeless patients.

**Citation:** Eseadi C, Amedu AN, Aloh HE. Significance of fostering the mental health of patients with diabetes through critical time intervention. *World J Clin Cases* 2023; 11(36): 8486-8497

**URL:** <https://www.wjgnet.com/2307-8960/full/v11/i36/8486.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v11.i36.8486>

## INTRODUCTION

Diabetes can cause other health problems and complications, both physically and psychologically. Diabetes is a chronic disorder of metabolism that has become a major health concern worldwide. It is characterized by absolute deficits in insulin secretion; chronic hyperglycemia; and abnormal carbohydrate, lipid, and protein metabolism[1]. Glucose levels in the blood are elevated in people with diabetes[2]. In the literature, diabetes has been classified into four types: Type 1 diabetes (T1D), type 2 diabetes (T2D), gestational diabetes (GD), and other diabetes associated with certain specific conditions such as pathologies or disorder[3,4]. T1D is insulin-dependent diabetes, which constitutes 5%-10% of all diabetic cases. T1D is an autoimmune disorder distinguished by T cell-mediated degeneration of pancreatic  $\beta$  cells, ultimately resulting in insulin depletion and hyperglycemia[5]. The pathogenesis of T1D is influenced by both genetic and environmental factors, and the pancreatic  $\beta$  cell-specific autoimmunity development rate is rapid in infants and children. T2D is non-insulin-dependent diabetes that constitutes about 90%-95% of diabetes cases. The characteristics of T2D are abnormalities in insulin secretion,  $\beta$  cell dysfunction, and insulin resistance[6]. T2D is often undiagnosed because it progresses very slowly asymptotically over the years until the appearance of classic symptoms connected with severe hyperglycemia such as weight loss, growth impairment, polyuria, and polydipsia at the advanced stage. The pathogenesis of T2D is complex and involves multiple unknown and known features such as a combination of genetic predisposition and strong environmental influences. T2D is prevalent in older adults and is linked to obesity, inactivity, adoption of modern lifestyles, and a family history of diabetes[3]. GD is a type of diabetes linked to pregnancy, which is diagnosed between the second and third trimesters excluding undetected T2D. GD is characterized by an increase in blood glucose levels in the third trimester of pregnancy. Ninety percent of diabetes and its complications in such a period are attributed to GD, with a prevalence varying from 1% to 14%[7]. The risk of GD is linked to older age, previous pregnancy with a large baby, obesity, and a history of impaired glucose tolerance and is associated with a high lifetime risk of developing T2D[3]. Other types of diabetes associated with peculiar conditions such as pathologies or many disorders are those stemming from monogenic defects in  $\beta$  cell function, genetic abnormalities in insulin action, and exocrine pancreatic pathologies, among other conditions[8].

Diabetic patients may feel insecure in terms of their mental health. As a result, they monitor their blood glucose excessively, worry about complications, and constantly monitor their personal and work lives. When diabetes and mental illness coexist, the prognosis is often poor[9]. Complex interventions are often required for chronic and comorbid illnesses. Medications are in most cases less effective at treating all facets of diabetes and mental illness together[10]. As a chronic disease, it can impair daily function and mobility, which are more prevalent in homeless people than in homeowners[11]. Having diabetes can be physically and emotionally difficult, both for those with the disease and their families. As a result, people living with it must manage the disease continuously.

There are a number of mental health issues, such as anxiety and depression, which can affect diabetic patients. Diabetes has been linked to mental health complications such as psychotic disorders and complications distinctive to diabetic patients[12]. A number of terms were also utilized to describe the mental health problems connected with diabetes. For example, "diabetes distress" describes the negative emotions experienced by people with diabetes, as well as the burden of managing it, which explains the feelings of despair and emotional turmoil that are specifically related to diabetes, particularly the need for continued monitoring and care, ongoing concerns regarding complications, and the potential for professional and personal relationships to be eroded[13]. A condition known as psychological insulin resistance is characterized by an unwillingness to accept insulin therapy, leading to a delay in starting treatment[14]. Knowledge of the relationship between diabetes and mental health is crucial in that psychiatric and diabetes-specific psychosocial problems

are associated with diminished participation in self-management activities that can decrease the quality of life and care for victims and their families. Complications related to diabetes and mortality in the early stages are associated with psychiatric disorders in diabetic patients[15]. In addition to depression, anxiety, and eating disorders, individuals with T1D or T2D are at increased risk of these conditions[16]. For example, depression rates across the lifespan are twice as high for diabetics as for the general population. It was predicted that diabetic patients have poorer mental health generally, and in a variety of mental health dimensions in particular[17]. In addition, studies in the past have shown that diabetes is linked to severe depressive disorder, anxiety, bipolar disorder[18], schizophrenia[19], personality disorders[20, 21], stress, trauma, abuse and neglect[22,23], and sleep issues[23]. To reduce the morbidity and mortality associated with diabetes and mental health conditions, non-pharmacological interventions such as critical time intervention (CTI) can be used.

CTI is an intervention program that is time-limited and designed to decrease the adverse effects associated with homelessness and other risky outcomes by providing assistance to individuals in their critical transitional time[24-26]. CTI is characterized by concentrated case management that lasts for 6 to 9 mo and is geared towards assisting mental health patients navigate the severe service system and create contact with long-term community-based links, resources, and interventions[26]. CTI may benefit adults with diabetes and mental health challenges. As a result, comorbid diabetes and mental health conditions make maintaining lifestyle changes more difficult. As a result, this group has more difficulty recognizing and discussing their health concerns, and engaging with services to manage their health[27]. Homelessness and inadequate care may also be challenges they face. Although CTI has received a lot of attention as a way of managing mental health conditions, little is known about its effectiveness in managing and treating coexistent diabetes and mental health conditions. CTI is an evidence-based practice designed to mobilize support for society's most disadvantaged individuals in times of transition[28]. This promotes greater integration into the community and ensures a continuous flow of care by allowing people to remain connected to their communities and social support networks during these difficult times. CTI is also a type of time-limited, intensive case management model of treatment, which helps maintain continuity of care for service users while they are in transition such as from a shelter to a private residence after discharge[25]. As a result of this intervention, a person's network of support within the community is strengthened [29].

In addition to reducing the risk of homelessness after institutional discharge, CTI strives to enhance the quality of life for individuals and families. It also provides time-limited direct support in terms of emotional and practical assistance during the period of transition by reinforcing the consumer's long-term ties to formal services, family, and friends[28]. Among the key features of CTI is the provision of post-discharge assistance by workers who have maintained close contact with clients before discharge[30]. Aside from providing emotional and practical assistance during critical transition periods, CTI also offers case management services to enhance the relationship between an individual and their family, friends, and services[31]. There are three stages of CTI[25]: (1) Providing direct assistance to the client and assessing the resources available to support the client; (2) evaluating and adjusting the support systems as necessary; and (3) ensuring that existing community resources are transferred to the client. A variety of groups have benefited from CTI, including veterans, individual with psychiatric disorders, those who have been incarcerated, and people with diabetes. After being discharged from hospitals, shelters, prisons, and other institutions, individuals with mental illness may become homeless. The foundation of CTI rests on elements found in other evidence-based models such as small caseloads, active community outreach, individual case management plans, psychosocial skill building, and motivational coaching are key elements[32-34].

Notwithstanding the substantial role of CTI in the management of mental health problems in patients with other health problems, there is a lacuna with respect to documented empirical evidence of the effectiveness of CTI in enhancing the mental health of diabetic patients. Therefore, conducting a scoping literature review to establish the scope and depth of empirical research on the effectiveness of CTI in improving the mental health of patients with diabetes is necessary due to the prevalence of diabetes worldwide. Taking this study into account, public health practitioners will be able to determine the extent of CTI's effectiveness in improving the mental wellbeing of diabetics. Furthermore, psychologists or therapists will find this study useful since it will expose the existing gaps regarding CTI in treating the mental health of diabetic patients.

Therefore, the major aim of this study was to establish the current significance of fostering the mental health of patients with diabetes through CTI by conducting a scoping review of the available empirical studies.

## Research questions

The following questions were addressed by this review:

What are the mental health challenges associated with homeless diabetic patients?

What is the impact of CTI in enhancing the mental health of homeless individuals during the time of transition?

## MATERIALS AND METHODS

### Study design

Based on a scoping review of existing research studies, the current study examined the significance of fostering the mental health of diabetic patients through CTI. Due to the fact that the study relied on empirical literature analysis, no ethics approval was necessary. Scoping reviews are a valuable tool for mapping the research process on a specific topic.

### Protocol development

A protocol defining the methods and defining the inclusion and exclusion criteria was developed in advance. In this review, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses[34].

### Data sources and guidelines

The literature was searched extensively using medical and scientific databases including Google Scholar, PubMed, Scopus, PsycINFO, Reference Citation Analysis (<https://www.referencecitationanalysis.com/>), and Cochrane Library. Boolean operators were applied to a specific set of keywords (*i.e.* "OR," "AND") during the literature search. Search queries were used across titles, abstracts, subject-specific keywords, and topic fields in databases. The key words used in the primary search stage were: "Diabetes mellitus" OR "type I diabetes" OR "type II diabetes" AND "Mental health" "psychosocial support," "psychological," "psychiatric," "anxiety," "depression," AND "critical time interventions" and other terms relevant to the current study (see Table 1).

Following the preliminary search, which ended on September 20, 2023, the researchers added additional search terms to the list based on the results of the first search. The reference lists of the articles included in the search were further reviewed.

### Eligibility criteria

This scoping review included articles that met all of the following criteria: Studies that attempted to treat participants of any age with comorbid diabetes and mental health condition; primary studies using either a retrospective or prospective design or a quantitative and/or qualitative design including clinical trials; studies in any country across the globe; full-length studies that were published in journals as peer-reviewed articles; and studies conducted in any year. There were no restrictions on variables such as culture, stage of illness, occupational class, or education. The searches were limited to the English language as the time and cost of translation were not feasible within this review's timeline.

The exclusion criteria were: Studies that dealt only with the prevalence of mental health among diabetic patients; opinion papers, pre-conference abstracts, and review studies; non-English language articles; commentaries, editorials, or case studies on transition; and studies that treated diabetes without either a mental health construct or homelessness.

### Study selection and data extraction

**Screening:** After the database search was completed, the results were exported into Zotero and duplicates were removed. To evaluate all retrieved citations, the authors used a cloud-based systematic review management portal (rayyan.ai). Next, titles were screened to exclude irrelevant publications, opinion papers, and reviews. Then all titles and abstracts of papers were screened by two reviewers using stipulated inclusion and exclusion criteria. To extract and synthesize data, all citations eligible for full-text review were examined using the same methodology. We kept articles with uncertain eligibility status for further review during the assessment process. Finally, the abstracts were read to determine whether the study's aim met the scoping review question.

**Selection:** The full-text articles were read to confirm each study's eligibility according to the inclusion and exclusion criteria. A third reviewer assisted the first two reviewers in resolving potential conflicts about eligibility through discussion after all articles selected after screening were independently reviewed. Data extraction was completed after discrepancies were resolved and papers meeting standards for inclusion were selected.

**Data extraction process:** In the extraction phase, the data were independently extracted from articles according to the theme, purposes, and questions of the present scoping review. Relevant information from all included papers were extracted using a pre-designed data extraction form that included items on study characteristics [*e.g.*, author and year of study, location, population and year of the study, study objective, type of mental health disorder, participants' characteristics (age of participants and sex among others), method and sample, intervention description and findings]. Two reviewers participated independently in the data extraction process, and a third author reviewed all of the extracted data to ensure consistency and accuracy. All reviewers participating in data extraction discussed discrepancies and reached a consensus.

### Data synthesis

Using the collective body of evidence, this scoping review produced an evidence map and identified potential gaps. A summary of the major study variables, interventions, and all comorbidity health outcomes were provided by the authors. The findings were arranged and presented in tabular form to provide an overview of the existing studies.

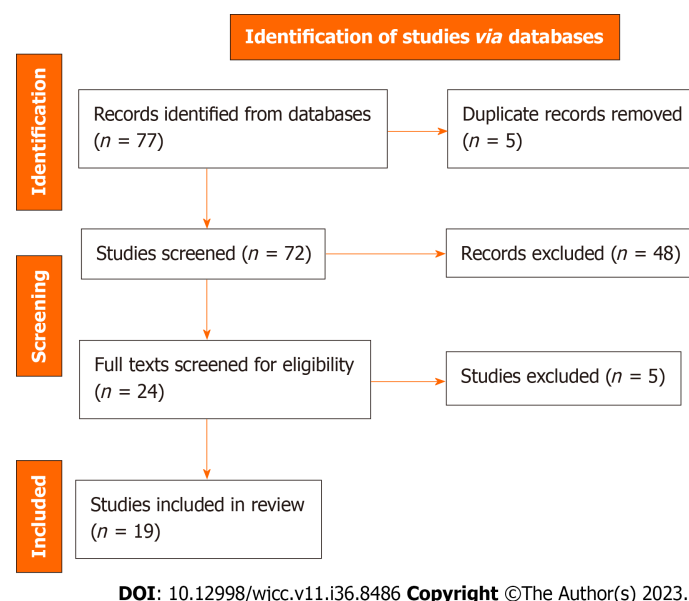
## RESULTS

### Selection of sources of evidence

A total of 77 articles related to the mental health of people with diabetes were found during the electronic search of the six databases. Following the removal of duplicates, 72 papers remained. Two independent researchers assessed papers based on stipulated criteria to exclude 48 papers in the first screening, which involved reading titles and abstracts. As a result, 24 papers were screened a second time by reading the full texts while still looking for the inclusion criteria, and three articles were finally selected for data extraction. After full-text assessment, more than five papers were excluded, as shown in Figure 1.

**Table 1** Search strategy used in this scoping review

Search query	Search keywords applied on titles, abstracts, topics, and subject headings
1	"Diabetes mellitus" OR "type I diabetes" OR "type II diabetes" OR "diabetic patients" OR "people with diabetes" OR "diabetic conditions"
2	"Mental health" OR "psychosocial support" OR "psychological" OR "psychiatric" OR "anxiety," OR "depression," OR "fear" OR "phobia" OR "dental wellbeing" OR "dental well-being" OR "dental disorder" OR "oral health" OR "wellbeing" OR "mental disorder" OR "schizophrenia" OR "trauma"
3	"Critical time interventions" OR "case management interventions"
Final search query	1 AND 2 AND 3

**Figure 1** Flow chart illustrating the screening and selection process of this scoping review.

An overview of the included studies is provided in [Table 2](#). Findings from this scoping review revealed that the 19 articles[25,35-52] selected for data extraction were published between 2007 and 2022. The distribution of these studies reviewed across the globe showed that five studies were conducted in Canada, the United States, Japan, Britain, and the Netherlands. The study design included six survey studies, three qualitative, one retrospective evaluation, seven randomized controlled trial, and one mixed method. The minimum sample size of the included studies was five while the maximum was 6944. Of these 19 studies, 6 focused on mental health, 9 were on CTI, and 4 were on the management of diabetes among homeless individuals.

## DISCUSSION

To foster the mental health of homeless diabetic patients, this study used the scoping review approach to reveal the mental health challenges of homeless diabetic patients and the impact of CTI in enhancing the mental health of homeless individuals during the time of transition. Regarding the mental health challenges associated with homeless diabetic patients, this study revealed that diabetic patients with a history of homelessness are more likely to be diagnosed with mental illness such as self-management disorder, low perception, depression, substance abuse, cognitive disability, psychotic disorder, and bipolar disorder. The comorbidity of diabetes and mental health problems of homeless patients are associated with higher hemoglobin A1c (HBA1c). However, taking medication with increased support and supervision in a shelter for patients with mental illness substantially reduces the HBA1c[46].

This review also found that social support services are impactful in the management of comorbidity of diabetes and mental health problems. Such social supports that enhances the mental health of diabetic patients are affordable house rent and rental assistance, which reduce diabetic patients' expenditure with respect to rent and increases their financial muscle to offset their diabetes-related expenses[47]. In addition, a study identified that provision of in-shelter care, peer outreach and support, diabetes specialty outreach clinics, diabetes group care specific for this population, and community-based pharmacy interventions are impactful in the management of the mental health of homeless diabetic patients[37,42]. Group medical visits to the shelter of homeless diabetic patients have been found to be impactful and

**Table 2 Studies concerning the mental health challenges associated with homeless diabetic patients and impact of critical time intervention in enhancing mental health of homeless individuals during the time of transition**

Authors	Location/population	Objectives	Mental health disorder/CTI/management of diabetes	Method/sample	Results
Lennox <i>et al</i> [25]	Britain, 14	CTI model was adapted to reflect the stages of transition for prisoners in England	CTI	Mixed method of qualitative and quasi-experimental	CTI intervention groups showed a lower level of anxiety regarding release and more support in terms of housing, access to services, and reintegration into the community as compared to previous imprisonment
Wiens <i>et al</i> [35]	Ontario, & Toronto, 6944	To create a population cohort of people with diabetes with a history of homelessness to understand their unique demographic and clinical characteristics and improve long-term health outcomes	Psychotic disorder, Bipolar disorder	Descriptive	Patients with a history of homelessness were more likely to be diagnosed with mental illness (49% <i>vs</i> 2%) and be admitted to a designated inpatient mental health bed (37% <i>vs</i> 1%). A suitable match was found for 5219 (75%) diabetic people with documented homelessness after the intervention. The derived matched cohort was balanced on important demographic and clinical characteristics
Davachi and Ferrari [36]	CDIRC in Canada, 524	To develop an accessible and effective diabetes management support for the homeless population especially those at risk or already diagnosed with diabetes	chronic disease self-management disorder	Survey study	There was a reduction in participants FBG and their HbA1c levels. Although the low numbers of follow-up data collected, the mean reductions in FBG of 4 mmol/L and HbA1c of 1.1% is significant for this population. Baseline results and results captured at the 3 to 12 mo follow-ups were only available for 10 patients with pre-existing diabetes
Thompson <i>et al</i> [37]	Canada, 52	Group medical visits, GMV in primary care for patients with diabetes and low socioeconomic status and low perception of life: users' perspectives and lessons for practitioners	Low perception of life	Qualitative research design	The GMV as a CTI promotes group identification and cohesion against the Diabetes mellitus disease process. The relationships made within the group were found to be supportive and therapeutic. It may also improve individuals' perception of diabetes management from problem solving, modelling, information and education, emotional support, accountability, and social competition
Campbell <i>et al</i> [38]	Canada, 28	To report the experiences of co-researchers with lived experience of homelessness and diabetes, giving voice to patients	Community-based participatory research approach	Qualitative	Many participants felt that the study provided them with intangible benefits, including feeling respected, valued, and heard; feeling accomplished and purposeful, resulting in improved self-efficacy in other areas; and building a sense of community with others who shared many of their life experiences
Campbell <i>et al</i> [39]	Canada, 96	The study documented the innovations in providing diabetes care for individuals experiencing homelessness	Management of diabetes	Survey	Among homeless individuals, this study identified five innovative and unique approaches to diabetes care. Among these approaches are the provision of in-shelter care, the provision of peer outreach, the provision of diabetes specialty outreach clinics, and the provision of diabetes group care specific to this population
Mayberry <i>et al</i> [40]	TN United States, 9	Explore acceptability of engaging family/friends in patients' T2D self-management using text messaging	Depressive symptoms	Qualitative	A majority of participants (48%) cited needing assistance and seeing the benefits of engaging others as reasons for inviting a support person, while reasons for not inviting one included being an unnecessary "burden" or being unable to text. As a result of the texts, support persons reported an increase in awareness, a creation of dialogue, and an improvement in their own health and behavior
Elder and Tubb [41]	United States, 15	Seeks to understand barriers and enablers to health for homeless people with diabetes as perceived by homeless persons and providers	Management of diabetes	Survey	Despite being regarded as peripheral to diabetes care, all social service providers considered their primary roles to be important

Kaspro and Rosenheck [42]	United States, 484	evaluate an effort to disseminate a program of CTI case management for homeless veterans with mental illness being discharged from veteran psychiatric inpatient units	CTI	Randomized controlled trial	A higher proportion of CTI clients spent more time at home and fewer days in institutional settings than those receiving typical VA services. Clients of CTI case management also reported a reduction in alcohol consumption, drug use, and psychiatric disorders
Clark <i>et al</i> [43]	United States, 230	examine two the CTI management for people with co-occurring disorders and histories of chronic homelessness and to better understand their roles in permanent supported housing	CTI	Descriptive	A significant decrease in alcohol consumption, drug use, and psychological symptoms was also observed in participants of the CTI program
Shinn <i>et al</i> [44]	United States, 200	compared effects of a FCTI to usual care for children in 200 newly homeless families in which mothers had diagnosable mental illness or substance problem	CTI	Randomized trial	In children 6-10 and in adolescents 11-16, referrals to FCTI resulted in fewer internalizing and externalizing problems, as well as self-reported school troubles
Tomita and Herman [45]	New York City, 150	Evaluated the impact of CTI in reducing rehospitalization among formerly homeless individuals with severe and persistent mental illness after discharge from inpatient psychiatric treatment	CTI	Randomized control trial	The study revealed that CTI is effective in lowering psychiatric rehospitalization and efficient in reducing the likelihood of recurrent of homelessness
Asgary <i>et al</i> [46]	New York City, 418	This study assesses diabetes control and rates and predictors of diabetes that is not well-managed among patients experiencing homelessness compared with those of domiciled patients who receive medical care at New York City's shelter-clinics	Mental illness, substance abuse	Retrospective evaluative of T2D measurement	Homeless patients were more likely to have inadequately managed diabetes than other patients. The average HBA1c of homeless individuals was greater than that of domiciled individuals. There was a significant association between diabetic patients with mental illness and a lower HBA1c, as a result of better living conditions in their shelters
Keene <i>et al</i> [47]	United States, 5	Examine transitions into rent-assisted housing as they relate to diabetes self-management behaviors	Management of diabetes	Survey	Participants were able to reduce financial stress and offset diabetes-related expenses as a result of affordable housing and rental assistance
Yamamoto <i>et al</i> [48]	Japan, 106	survey of the prevalence of diabetes and prediabetes among homeless men in Nagoya, Japan	Cognitive disability	Descriptive survey	Prevalence of prediabetes differed significantly between groups with and without a history of social support. The prevalence of prediabetes was lower in the group with social support than in others. Early intervention for preventing diabetes and social support focused on diabetes management is imperative for homeless people
Shaw <i>et al</i> [49]	Britain, 150	Establish effectiveness of CTI in improving engagement of prisoners with mental illness	CTI	Parallel group randomized controlled trial	Participants engaged more fully with CTI than their counterparts. However, the difference was not substantial. Furthermore, the intervention group demonstrated better continuity of care and improved access to services
Jarrett <i>et al</i> [50]	United Kingdom, 60	This study aimed to see whether a CTI in the 1 <sup>st</sup> week's post-release effectively connects mentally ill prisoners with social, clinical, housing, and welfare services on leaving prison	CTI	Randomized Controlled	The CTI program significantly increased the number of prisoners receiving medication and being registered with their general practitioner
de Vet <i>et al</i> [51]	Dutch, 183	Examined the evidence base in Europe for effective interventions that improve the wellbeing of homeless people	CTI	Parallel-group randomized controlled trial	The CTI significantly enhanced the social support of individuals experiencing low levels of social support and psychological distress
Lako <i>et al</i> [52]	Europe, 136	To examine the effectiveness of CTI—an evidence-based intervention—for abused women transitioning from women's shelters to community living	CTI	A randomized controlled trial	There is evidence that CTI is effective in reducing post-traumatic stress symptoms and unmet care needs in a population of abused women

CDIRC: Calgary drop-in & rehab centre; CTI: Critical time intervention; FBG: Fasting blood glucose; FCTI: Family critical time intervention; GMV: Group medical visit; T2D: Type 2 diabetes; HBA1c: Hemoglobin A1c.

therapeutic[37]. This is attributed to its tendency to improve individual patient's perception of diabetes management, emotional support, accountability, and social competition. This means that medical visits give patients hope and make them feel a part of society. Therefore, social support services are an integral and impactful mechanism of managing the mental health of diabetic patients, as diabetes management with an enriched support system facilitates patient recovery from diabetes symptoms such as a reduction in fasting blood glucose and HbA1c levels.

This review reveals that CTI is impactful in enhancing the mental health of homeless patients during the transitional period from the hospital through social support and interventions to ensure that their needs are met and delivered in a timely manner as well as engagement of these homeless patients. However, the effectiveness of CTI has not been tested in homeless diabetic patients. This means that there is a lacuna in the use of CTI to enhance the mental health of patients with diabetes, especially homeless individuals transitioning from the hospital. However, the literature has shown that the effectiveness of CTI has been established in homeless individuals with mental health problems. A study revealed that CTI enhanced participants' engagement in continuity with care and improved access to service[49]. Access to service is one focus of CTI, especially for homeless patients during the transition process. CTI is a robust intervention for promoting social support in individuals experiencing psychological distress who have less social support[51]; it promotes the fulfillment of unmet needs and lessens the symptoms of post-traumatic stress symptoms among abused women[52]. Furthermore, CTI is also helpful in transitioning prisoners with mental illness because clients who receive CTI intervention are less anxious about their release and reportedly receive more support for housing, access to services, and community reintegration than their counterparts[25]. CTI also reportedly facilitates their access to medication[50], lowering psychiatric rehospitalization rates and preventing the recurrence of homelessness[45].

The reviewed studies revealed that CTI is impactful in managing individuals with a history of chronic homelessness and co-occurring disorders through a decrease in alcohol use, drugs, and psychiatric symptoms[35,46,47], possibly due to the fact that they are known to suffer from a higher frequency of diabetes-related adverse consequences. A number of factors contribute to this disparity including inadequate access to medical care, inability to pay for medications and supplies, dissatisfaction with healthcare providers, and conflicting priorities.

Moreover, one of the major contributors to the disparities in outcomes is likely related to the fact that diabetes treatments are often not tailored to the specific needs and circumstances of people who are homeless. According to the reviews, no studies have specifically examined the impact of CTI on the mental health of diabetic patients. This indicates that there is a gap in the literature concerning CTI for fostering diabetic patients' mental health. Therefore, more studies are needed to truly understand CTI's impact on the mental health of diabetic patients.

This review identified two key findings regarding CTI's effectiveness in managing the mental health of homeless patients. First, CTI improves housing outcomes and service engagement use outcomes for homeless people with diabetes-related ailments and their mental health conditions. Results like these coincide with CTI's focus of connecting individuals with community services and support to address critical transition needs. It is clear from these findings that the CTI model is practical and adaptable in that it can be successfully implemented in a variety of settings and populations[53]. This assertion was demonstrated in the study by Davachi and Ferrari[36], which used a survey research design to conduct a 12-mo intervention study to develop a diabetes management support program for homeless people, especially those at risk or already diagnosed with the disease. According to the study by Davachi and Ferrari[36], social service support, which is part of CTI, is effective for managing the mental health of people with pre-existing diabetes. A cohort study conducted by Wiens *et al*[35] between 2006 and 2019 in Ontario, Toronto in Canada further supports the above assertion. According to the study, 5219 diabetic people with documented homelessness (75%) found suitable matches. An important demographic and clinical characteristic of diabetic people was also balanced within a derived matched cohort. Second, CTI has been shown to be supportive and therapeutic in managing diabetic patients' mental health. This is substantiated by the studies of Shaw *et al*[49], de Vet *et al*[51], Kaspro and Rosenheck[42], and Shinn *et al*[44] whose findings proved that CTI is effective in enhancing the mental health of homeless individuals. CTI may improve individuals' perception of diabetes management through problem solving, modeling, information and education, emotional support, accountability, and social competition.

### **Implications of findings and recommendations**

This study revealed that diabetic patients with a history of homelessness are more likely to be diagnosed with mental illness, and social support services are impactful for the management of comorbidity of diabetes and mental health problems. This indicates that the mental health disorder of homeless diabetic patients could be attributed to the adverse effects of their environment, which predispose them to substance abuse that increases their mental disorder. Therefore, an intervention such as CTI, which focuses on enhancing the mental health of homeless diabetic patients, is required to facilitate and manage their smooth transition and ensure that they have access to support services that facilitate their integration into society. This study supports existing research demonstrating that CTI is highly effective, supportive, and therapeutic for managing the mental health of patients, especially those who are homeless or have a history of homelessness. As a result, most homeless patients' mental health disorders are managed using either or both of these interventions and ultimately are successful in overcoming their challenges. Therefore, healthcare professionals are well positioned to identify homeless patients and work with them to reduce their individual barriers to diabetes care; however, organizations must ensure that patients are connected to the larger health care system and facilitate low barriers to accessing diabetes care. This review found limited evidence addressing how CTI achieves its positive effects. Exactly how CTI reduces the mental health conditions of diabetic patients with homelessness and other outcomes is unknown. Consequently, this lays the groundwork for future studies investigating CTI's impact on diabetic mental health. Further research is clearly needed to determine whether and how CTI's program components affect specific outcomes and to map these components onto specific mediators.

### Limitations of the review

Due to the unavailability of studies that specifically dealt with the impact of CTI on homeless diabetic patients, this review revolved around the mental health challenges associated with homeless diabetic patients and the impact of CTI in enhancing the mental health of homeless individuals during the time of transition. Second, the included studies used a variety of populations and settings, resulting in a difficult comparison across them. Accordingly, we did not assess methodological quality or bias risk in accordance with the adhering guidelines. Furthermore, the study did not examine the cost of CTI or examine other kinds of case management interventions that could be used in treating diabetic patients' mental health, instead focusing solely on CTI. Therefore, future reviews should consider all kinds of case management interventions that may be used. Furthermore, we retrieved literature from leading databases to include peer-reviewed articles, while unpublished studies from unselected databases were not included. Last but not least, including only English-language articles may have resulted in a loss of evidence regarding the effectiveness of CTI for diabetic mental health.

## CONCLUSION

This review has shown that homeless diabetic patients are frequently diagnosed with several mental health problems, which require an intervention program such as CTI for enhancing their mental health. The available literature reviewed for this research shows that there is no specific CTI study that focused on managing the mental health of diabetic patients. This indicates that it has not been given adequate attention by researchers. In light of this, more empirical studies should be conducted across the globe, using both participants in hospitals as well as community-based settings to determine the effectiveness of CTI in managing mental health of diabetic patients more effectively and clearly.

## ARTICLE HIGHLIGHTS

### Research background

Critical time intervention (CTI) is an evidence-based model of practice that is time-limited and aims to provide support for most susceptible individuals during a transition period.

### Research motivation

Diabetes can cause other health problems and complications, both physically and psychologically. To reduce the morbidity and mortality associated with diabetes and mental health conditions, non-pharmacological interventions such as CTI can be used.

### Research objectives

This research examined the significance of fostering the mental health of diabetes patients through CTI.

### Research methods

This research employed the scoping review methodology and followed the guidelines established by the Joanna Briggs Institute. The search databases were Google Scholar, PubMed, Scopus, PsycINFO, Reference Citation Analysis (<https://www.referencecitationanalysis.com/>), and Cochrane Library.

### Research results

Diabetic patients who had experienced homelessness are at higher risk of being diagnosed with mental illness, and social support services are impactful in the management of the comorbidity of diabetes and mental health problems. CTI is impactful in enhancing the mental health of homeless patients during the transitional period from the hospital through social support services.

### Research conclusions

CTI is a promising intervention for alleviating mental health symptoms in homeless patients. Empirical studies are needed to determine how clinically effectively CTI is in managing the mental health of diabetics.

### Research perspectives

It is crucial to facilitate and manage the smooth transition of homeless diabetic patients into society, as well as to ensure that they have access to supports services that facilitate their integration into society, by providing CTI that focus on enhancing their mental health.

## FOOTNOTES

**Author contributions:** Eseadi C, Amedu AN, and Aloah HE conceived the research; conducted a review of the literature, literature

analysis, drafting, editing; All authors approved the final version of the manuscript.

**Conflict-of-interest statement:** All the authors report no relevant conflicts of interest for this article.

**PRISMA 2009 Checklist statement:** The authors have read the PRISMA 2009 Checklist, and the manuscript was prepared and revised according to the PRISMA 2009 Checklist.

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**S-Editor:** Li L

**L-Editor:** Filipodia

**P-Editor:** Li L

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