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Effectiveness of multidisciplinary glycemic management program

Submission date
16/09/2026

Recruitment status
No longer recruiting

Registration date
16/09/2026

Overall study status
Completed

Last Edited
16/09/2026

Condition category
Nutritional, Metabolic, Endocrine

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol
Background and study aims
Informatics-supported hospital-wide glycemic management improves inpatient glucose control, but evidence from primary hospitals and postdischarge outcomes remains limited. This study evaluated a virtual ward-based multidisciplinary glycemic management program for orthopedic inpatients with type 2 diabetes.

Who can participate?
Orthopedic inpatients with type 2 diabetes

What does the study involve?
Consecutive eligible patients admitted between January and December 2024 constituted the control group and received usual ward-based glycemic management. Patients admitted between January and December 2025 constituted the intervention group and received the virtual ward-based program.

What are the possible benefits and risks of participating?
This transformation shifts abnormal blood glucose management from passive, sequential responses to active identification and preemptive intervention based on real-time data, substantially shortening clinical response time. Integrating online trend analysis with an initial offline bedside assessment provides a dual safeguard for precise blood-glucose management. The informatized glycemic management program yields effects beyond behavioral and knowledge gains, extending into psychosocial domains and enabling patients to convert behavioral improvements into both physical and mental benefits. Hospital-wide informatization of glycemic management can optimize medical resource allocation by reducing both length of stay and the incidence of severe hypoglycemia.
intensive glucose-lowering therapy raises the risk of hypoglycemia, and balancing effective glycemic control with safety is the central challenge of perioperative glucose management.

Where is the study run from?
It was conducted in the orthopedic department of a hospital classified as a primary hospital under China’s hospital accreditation system.

When is the study starting and how long is it expected to run for?
This study started on January 1, 2024 and lasted for 2 and a half years.

Who is funding the study?
This study was supported by the Science and Technology Fund Project of Guizhou Provincial Health Commission (gzwkj2025-576).

Who is the main contact?
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Contact information

Type(s)
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Study information

Scientific Title
Effectiveness of a virtual ward-based informatics multidisciplinary glycemic management program for hospitalized diabetic patients in the orthopedic department of a primary hospital: a quasi-experimental study

Study objectives
This study evaluated a virtual ward-based multidisciplinary glycemic management program for orthopedic inpatients with type 2 diabetes.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 08/05/2024, The Ethics Committee of Jinsha County People's Hospital (Yangdeng Community, Xiluo Street, Jinsha County, Bijie City, 551800, China; +86-8577216115; Zxying_xyz89@21cn.com), ref: No. Ethical Review [2024] No. 38

Primary study design
Interventional

Allocation
Non-randomized controlled trial

Masking
Open (masking not used)

Control
Active

Assignment
Parallel

Purpose
Supportive care, Treatment

Study type(s)

Health condition(s) or problem(s) studied
Orthopedic inpatients with type 2 diabetes

Interventions
A nonrandomized, non-concurrent, controlled quasi-experimental design.

The control group received usual ward-based glycemic management.

The intervention group received a virtual ward-based multidisciplinary glycemic management program.

The intervention consisted of four integrated components: staff training, a hospital-wide glycemic management platform, multidisciplinary clinical management, and structured post-discharge follow-up.

Training was coordinated by senior endocrinologists and endocrinology nurse leaders and was tailored to the responsibilities of different staff groups.

The hospital-wide glycemic management platform received and synchronized bedside glucose measurements with authorized nursing and medical workstations. A pre-meal glucose value above 7.8 mmol/L or a 2-hour postprandial value above 10.0 mmol/L generated an orange alert and prompted assessment for virtual ward enrollment and endocrinology review. Patients remained admitted to the orthopedic department while receiving additional specialist support through the virtual ward.

Endocrinologists reviewed system alerts and conducted an initial bedside assessment of patients enrolled in the virtual ward. Treatment plans were subsequently adjusted according to glucose trends and the patient's clinical condition.

Endocrinology specialist nurses reviewed glucose measurements and trends and provided individualized bedside education once daily. Orthopedic nurses performed prescribed bedside

glucose monitoring, administered glucose-lowering treatment, reinforced education on medication, diet, exercise, and self-monitoring, and checked the operation of connected devices used in the orthopedic ward. Diabetes liaison nurses supported implementation of the management protocol within the orthopedic department. Dietitians provided staged perioperative nutritional recommendations based on clinical status and glucose patterns. Information technology personnel were solely responsible for maintaining the platform, connected devices, data transmission, system security, and technical support.

Before discharge, endocrinology specialist nurses developed an individualized management plan and instructed patients in the use of a connected home glucose meter. Follow-up was conducted through the platform every 2 weeks for 3 months.

Intervention Type
Behavioural

Primary outcome(s)
1. The percentage of glucose measurements within the target range of 3.9–10.0 mmol/L measured using the number of valid glucose measurements within the target range divided by the total number of valid glucose measurements recorded during hospitalization, multiplied by 100, and is referred to as time in range (TIR) at during hospitalization

Key secondary outcome(s)
1. Number of hyperglycemic and hypoglycemic glucose measurements measured using blood glucose measurements during hospitalization, with hyperglycemia defined as a premeal glucose value >7.8 mmol/L or a 2-hour postprandial glucose value >10.0 mmol/L, and hypoglycemia defined as a glucose value <3.9 mmol/L, during hospitalization
2. Length of hospital stay measured using hospital records during hospitalization
3. Total hospitalization costs measured using hospital billing or administrative records during hospitalization
4. Diabetes knowledge measured using the Chinese version of the Michigan Diabetes Knowledge Test (23 items; total score range 0-23) at admission
5. Diabetes knowledge measured using the Chinese version of the Michigan Diabetes Knowledge Test (23 items; total score range 0-23) at 3 months after discharge
6. Diabetes self-management measured using the Chinese version of the Summary of Diabetes Self-Care Activities measure (12 items; total score range 0-84) at admission
7. Diabetes self-management measured using the Chinese version of the Summary of Diabetes Self-Care Activities measure (12 items; total score range 0-84) at 3 months after discharge
8. Diabetes-specific quality of life measured using the Chinese Diabetes Specific Quality of Life Scale (27 items; total score range 27-135) at admission
9. Diabetes-specific quality of life measured using the Chinese Diabetes Specific Quality of Life Scale (27 items; total score range 27-135) at 3 months after discharge
10. Appraisal of diabetes measured using the Chinese version of the Appraisal of Diabetes Scale (7 items; total score range 7-35) at admission
11. Appraisal of diabetes measured using the Chinese version of the Appraisal of Diabetes Scale (7 items; total score range 7-35) at 3 months after discharge

Completion date
30/06/2026

Eligibility

Key inclusion criteria
1. Aged 18 years or older
2. Met the diagnostic criteria for type 2 diabetes specified in the Chinese Guidelines for the Prevention and Treatment of Type 2 Diabetes
3. Had an expected hospital stay of at least 3 days
4. Possessed adequate cognitive ability to complete the questionnaires independently or with assistance
5. Provided written informed consent

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
80 Years

Sex
All

Total final enrolment
254

Key exclusion criteria
1. Had non-type 2 diabetes (e.g., type 1 diabetes or other specific types of diabetes)
2. Presented with severe acute diabetic complications (e.g., diabetic ketoacidosis or hyperosmolar hyperglycaemic state)
3. Suffered from severe end-stage organ dysfunction, including:
3.1. Cardiac failure
3.2. Hepatic failure
3.3. Renal failure
4. Had terminal-stage malignancy
5. Withdrew consent
6. Was discharged against medical advice
7. Was transferred to another department during the index hospitalisation
8. Was lost to follow-up during the 3-month post-discharge period

Date of first enrolment
01/01/2024

Date of final enrolment
31/12/2025

Locations

Countries of recruitment

China

Sponsor information

Organisation
Jinsha County People's Hospital

Funder(s)

Funder type

Funder Name
The Science and Technology Fund Project of Guizhou Provincial Health Commission (gzwkj2025-576)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available