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Effect of evidence-based nursing on continuous renal replacement therapy

Submission date
26/03/2026

Recruitment status
No longer recruiting

Registration date
30/03/2026

Overall study status
Completed

Last Edited
30/03/2026

Condition category
Urological and Genital Diseases

[_] 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
To explore the effect of evidence-based nursing on preventing unplanned discontinuation of continuous renal replacement therapy (CRRT) in adult intensive care unit (ICU) patients.

Who can participate?
Adult ICU patients undergoing CRRT in the participating hospital.

What does the study involve?
Conventional nursing and evidence-based nursing were respectively applied to the control group and the intervention group for nursing care, to compare the unplanned discontinuation rate, CRRT circuit usage duration, nurses' knowledge awareness rate, and implementation rate of review items between the two groups.

What are the possible benefits and risks of participating?
Benefits and risks not provided at time of registration

Where is the study run from?
The China-Japan Union Hospital of Jilin University in Jilin Province, China.

When is the study starting and how long is it expected to run for?
January 2024 to December 2024. The study lasted for one year.

Who is funding the study:
Investgator initiated and funded.

Who is the main contact?
Dr Bing Yu, yu_bing2025yb@163.com

Contact information

Type(s)
Principal investigator, Scientific, Public

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Study information

Scientific Title
Effect of evidence-based nursing on unplanned discontinuation of continuous renal replacement therapy in adult ICU patients

Study objectives
To explore the effect of evidence-based nursing on preventing unplanned discontinuation of continuous renal replacement therapy in adult intensive care unit patients.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 22/01/2026, The Ethics Committee of China-Japan Union Hospital of Jilin University (No. 491, Minkang Road, Nanguan District, Changchun City, Jilin Province, Changchun City, 130033, China; +86 0431-84995047; ywlc2019@163.com), ref: 2026012210

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Placebo

Assignment
Parallel

Purpose
Supportive care

Study type(s)

Health condition(s) or problem(s) studied
Continuous renal replacement therapy

Interventions
Patients were randomly divided into a control group (conventional critical care) and an intervention group (evidence-based nursing) using a random number table method.

The intervention group received an evidence-based nursing intervention; the steps were as follows. During the study period, continuous renal replacement therapy (CRRT) nursing coverage followed the unit's staffing arrangement, and the intervention components were delivered to patients allocated to the intervention arm using standardized training, checklists, and quality-control procedures.

Establishment of evidence-based research team: a total of 10 members, including two nursing managers (responsible for program design and quality control), three ICU nurse team leaders (working years ≥15 years, responsible for evidence summary and training), three ICU specialist nurses (working years ≥10 years, responsible for intervention implementation), and two nursing graduate students (responsible for data collection and statistics).

Evidence-based search and evidence screening: Using the keywords "continuous renal replacement therapy/CRRT", "unplanned interruption of CRRT", and "guidelines/best practices", we conducted an evidence-based search across major international and Chinese databases and guideline platforms (BMJ Best Practice, UpToDate, GIN, ISN, Cochrane Library, JBI database, PubMed, Embase, CNKI and Wanfang) from July 2019 to July 2024. Eligible evidence sources were appraised using AGREEII (for guidelines) and JBI tools (for other evidence types). Fifteen evidence sources were included: three guidelines, two expert consensus, eight evidence summaries, and two systematic reviews.

Making an intervention plan and reviewing items: The team evaluated the evidence, and combined with the actual situation of ICU, the Delphi method was used to conduct two rounds of Delphi expert letter consultation. The evidence was summarized and sorted out according to expert opinions, and the feasibility, suitability, clinical significance and effectiveness of the evidence were evaluated by the FAME structure table (feasibility, suitability, clinical significance and effectiveness). Form evidence indicators and corresponding review methods.

Training and quality control: systematic training was carried out by nurse team leaders. The structured training program lasted for two months, and a total of 72 nurses participated in the training. Led by the nurse team leader, the "theory + practice" integration training was carried out around the 12 review items in Table 2 and the corresponding 30 evidence indicators. Centralized training was conducted once a week (60 minutes of theoretical teaching, focusing on the interpretation of evidence connotation, operation standards and common problems, 90 minutes of practical operation, simulating key scenarios such as catheter selection before starting the machine, coagulation monitoring during operation, and sealing the tube after stopping the machine). This training emphasized standardized assessment and selection of appropriate catheters, rather than introducing different catheter types between groups. A comprehensive assessment was conducted once a month, including a theoretical test (accounting for 40%, question types covering single choice and case analysis, and focusing on the core requirements of the review items) + a practical assessment (accounting for 60%, on-site practice of three review items was randomly selected). The qualified standard of the assessment was a total score ≥80 points, and those who failed to pass were required to participate in a one-

week remedial training and examination. Workload associated with the training program: centralized training required approximately 2.5 hours per nurse per week (60 minutes theory + 90 minutes practice), in addition to the monthly comprehensive assessment and routine quality-control activities (including real-time tracking, record verification, and the monthly interdisciplinary meeting).

An interdisciplinary doctor-nurse collaboration meeting was organized once a month, and participants included the nursing team of the intervention group (nurse leader, ICU specialist nurse), nephrologists (two, responsible for CRRT treatment plan formulation and anticoagulation strategy guidance), clinical pharmacists (one, responsible for anticoagulant drug dosage and adverse reaction evaluation) and quality control personnel. The core of the meeting was case discussion + problem review. Typical cases with repeated unplanned CRRT interruptions /disconnections in the same month (such as multiple interruptions due to insufficient coagulation status assessment leading to circuit clotting) were selected, and the doctors and nurses jointly analyzed the problems in the connection between nursing operation and medical plan (such as the matching between anticoagulant drug adjustment and coagulation monitoring frequency). In view of the difficulties in the implementation of the review items (such as the coordination of catheter tip position assessment and imaging examination), the division of labor between doctors and nurses was clarified (doctors prescribed imaging examination, nurses tracked and recorded the evaluation results). Synchronizing and updating the answers to clinical questions (such as the nursing points after adjusting the anticoagulation program for special patients), forming meeting minutes and synchronizing them to all the nurses in the intervention group to ensure that doctors and nurses have a consistent understanding of CRRT nursing standards and reduce interprofessional cohesion barriers in the transformation of evidence and practice.

Quality control was carried out by establishing a special person tracking + regular spot check evaluation mechanism. Two trained ICU specialist nurses were designated as quality control personnel. When the nurses carried out the whole process of CRRT nursing (before, during and after the machine), Table 2 was synchronized to review the real-time observation records of the entries. The nursing records of 50% of patients in the intervention group (including 12 review items such as catheter selection, aseptic operation and coagulation monitoring) were randomly selected by nursing managers and nurse team leaders every month, and the standardization of operation was reviewed combined with 10 on-site unscheduled examinations.

Nursing records and on-site assessment were randomly checked every month, and 12 review items determined based on the Delphi expert consultation method were used as the core evaluation basis. The number of single-item implementations meeting the standard/the total number of implementations of the item ×100%≥80%, and the average implementation rate of all items ≥85% were considered as the overall standard. If the implementation rate of a single item was less than 80% for two consecutive spot checks, special rectification (retraining the operation standard of the item and optimizing the process details) should be initiated.

Intervention Type
Behavioural

Primary outcome(s)
1. Incidence of unplanned weaning from continuous renal replacement therapy (CRRT) measured using data collected and used to calculate the ratio of the number of unplanned weaning cases to the total number of CRRT treatment cases during the CRRT treatment cycle included in the study (number of unplanned weaning cases/total number of treatment cases ×100%) at 1 month

Key secondary outcome(s)
1. CRRT circuit use time measured using the duration (unit: hours) of a single CRRT circuit from the start of treatment to the first unplanned off-line (such as filter coagulation, pipeline failure) or normal off-line (such as achieving the planned 24/48h treatment time); in case of unplanned off-line replacement of pipes in a single CRRT treatment, the use time of each set of pipes was recorded. Finally, the average use time of all pipes in a single treatment was included in the statistics between the groups, and the equipment use log and nursing record were checked by a special person every day to ensure the accuracy of time recording at 1 hour

2. Nurses' awareness rate of unplanned off-line knowledge measured using self-made questionnaire included three dimensions: pre-on-line management (35 points, such as catheter selection and aseptic operation), in-operation management (40 points, such as coagulation monitoring and alarm treatment) and post-off-line management (25 points, such as tube sealing technology), with a full score of 100. Evaluation was carried out at after 3 months of training.

3. Implementation rate of review items measured using the 12 review items in the "Quality review items and Methods of continuous replacement therapy for ICU Adult Patients to prevent unplanned weaning" determined by Delphi expert consultation method were the only criteria (such as "item 1: confirm the selection of appropriate catheters" and "item 6: Accurately assess the patient's coagulation function and the risk of machine coagulation "), each item corresponds to a clear operating standard. The evaluation was carried out by the same group of trained quality control staff (2 ICU specialist nurses) using real-time tracking + record verification, and the nursing records were checked against the standard in time during or after the implementation of the nurse to ensure the accuracy and timeliness of the evaluation. The calculation method was as follows: the execution rate of a single item = the number of times that the item was executed in accordance with the standard/the total number of executions ×100%). For example, item 4 "sterile operation" was performed 50 times in one month, of which 42 times met the standard of "2% chlorhexidine disinfection + maximum sterile barrier", and the implementation rate was 42/50×100%=84%, at 1 month

Completion date
10/04/2025

Eligibility

Key inclusion criteria
1. Age ≥18 years old
2. CRRT treatment duration ≥24 hours
3. Complete clinical data
4. Patients or their legal representatives voluntarily signed informed consent

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit

75 Years

Sex
All

Total final enrolment
417

Key exclusion criteria
1. Patients with abnormal coagulation function (prothrombin time >18 s or activated partial thromboplastin time >60 s)
2. Patients with severe mental disorders who cannot cooperate with treatment
3. CRRT-related complications (such as catheter infection) occurred before enrollment

Date of first enrolment
01/01/2024

Date of final enrolment
31/12/2024

Locations

Countries of recruitment
China

Sponsor information

Organisation
China-Japan Union Hospital of Jilin University

Funder(s)

Funder type

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not expected to be made available