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Analysis of barriers to thirst intervention in critically ill patients by ICU nurses: A qualitative study based on the Theoretical Domain Framework

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Research Article

Keywords: Intensive Care Unit, Nurse, Critically ill patients, Thirst, Theoretical Domain Framework, Qualitative Research

Posted Date: November 28th, 2025

DOI: https://doi.org/10.21203/rs.3.rs-7893573/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

Thirst is a common and highly distressing core symptom in critically ill patients, ranking as the second most significant source of distress after death. However, healthcare providers often underestimate its severity. Nurses play a crucial role in identifying and alleviating thirst, making it essential to understand the barriers affecting their ability to manage this symptom.

Objective

To explore the barriers to thirst management behaviors among intensive care unit nurses for critically ill patients, providing a reference basis for developing thirst management strategies for critically ill patients.

Methods

Purposeful sampling was used to develop an interview guide based on a theoretical domain framework. 13 intensive care unit nursing staff members were interviewed using a face-to-face semi-structured interview method, and the interview content was analyzed and coded using directed content analysis.

Results

Analysis of the interview results identified six theoretical domains influencing thirst management behaviors in critically ill patients: knowledge, skills, social/professional roles and identity, environment and resources, social influence, and behavioral norms. Key issues included healthcare providers' incomplete understanding of thirst management, weak awareness of thirst management, unfamiliarity with thirst assessment procedures, heavy daily workloads and equipment shortages, unfavorable organizational culture, and unclear processes and specific measures.

Conclusion

The implementation of thirst management for critically ill patients is influenced by multiple factors. The six areas identified in this study can serve as targets for improvement. Managers should explore strategies, and implementation plans for thirst management in critically ill patients to enhance the quality of thirst management for this population.

1. Introduction

Thirst is a subjective sensation regulated by multiple factors that drive fluid intake behavior(1). Due to various factors such as illness, treatment, and medications, severe patients commonly experience thirst symptoms(2, 3, 4). Multiple studies have indicated that thirst is one of the five symptoms that should be assessed daily in severe patients(5), and it is the most common and intense discomfort symptom(6, 7). Studies show that 70% of critically ill patients experience thirst symptoms, with a prevalence of moderate to severe thirst at 55.8%(8, 9, 10). Thirst induces intense anxiety and despair in critically ill patients, significantly impacting their psychological and mental well-being(7), and increases the risk of delirium (11)and post-ICU syndrome, thereby prolonging the treatment process and severely affecting patient outcomes. Thirst is considered by critically ill patients to be the second most stressful factor after death(12, 13). However, ICU healthcare providers do not place sufficient emphasis on thirst in critically ill patients, and most ICU nurses lack experience in managing thirst symptoms in critically ill patients. Their perception of patients' thirst often differs from the patients' own experiences, leading to a situation where patients' thirst is frequently underestimated, under-assessed, and under-managed in clinical nursing practice(14, 15). Currently, thirst in critically ill patients has not been systematically assessed or adequately addressed. Failure to promptly alleviate thirst not only severely impacts patient comfort and reduces nursing satisfaction but also increases the incidence of adverse events such as unplanned extubating(16, 17), posing higher demands and challenges for nursing work. The Theoretical Domain Framework is a theoretical framework that integrates various psychological theories and their underlying structures to study factors related to human behavioral change. Researchers can use the TDF to explore the factors influencing behavioral change from individual, organizational, and societal perspectives. Existing studies have confirmed(18, 19, 20) that by using the TDF to develop interview guidelines and conduct coding analysis for qualitative research, one can systematically and comprehensively identify and categorize the barriers involved. This study, based on the Theoretical Domain Framework and employing qualitative research methods, explores the barriers to thirst management in critically ill patients by ICU nurses, identifies the theoretical domains influencing ICU nurses' thirst management behaviors, and aims to guide the development of thirst management protocols for clinical healthcare providers, thereby improving thirst management practices for critically ill patients.

2. Methods

2.1 Research subjects

From July to August 2025, nurses from the intensive care unit of a tertiary-level hospital in Puning City were selected as interview subjects using purposive sampling. Inclusion criteria: nurses must have professional qualifications; ICU work experience ≥ 3 years; clear verbal communication skills; awareness of and consent to participate in this study. Exclusion criteria: Nurses not directly involved in patient care, such as administrative nurses or pharmacy nurses; nurses absent due to sick leave, maternity leave, or further education; rotating or further education nurses. The sample size was determined based on

information saturation. Basic information is presented in Table 1. All participants signed informed consent forms.

Table 1
Participant demographic characteristics

Participant	Gender	Age	Job Title	Years of experience in the ICU (years)
N1	Female	45	Deputy Chief Nurse	26
N2	Female	34	Senior Nurse	15
N3	Female	33	Senior Nurse	15
N4	Female	32	Senior Nurse	13
N5	Female	33	Senior Nurse	13
N6	Female	30	Senior Nurse	7
N7	Female	33	Junior Nurse	13
N8	Female	29	Junior Nurse	6
N9	Male	27	Nurse	5
N10	Male	34	Senior Nurse	13
N11	Male	30	Nurse	5
N12	Female	32	Senior Nurse	12
N13	Female	30	Junior Nurse	10

2.2 Developing interview guidelines

Based on a literature review, the research team preliminarily drafted an interview outline according to the research objectives and theoretical domain framework. They then conducted preliminary interviews with two nurses, adjusted the outline based on the results, and finalized the interview outline, which included 12 theoretical domains(21). The interview outline is shown in Table 2.

2.3 Data Collection and Analysis

This study used face-to-face semi-structured interviews. Before the interviews, the interviewees were informed of the purpose of the study and obtained informed consent before recording. A quiet duty room was selected as the interview location, and the interview duration was about 30 to 40 minutes. The interview process requires detailed records of the interviewee's expressions and nonverbal reactions. It is also necessary to pay attention to flexibly adjusting the order of questions in the outline, avoid leading questions, and encourage interviewees to actively express themselves. The interviewer should transcribe the audio and notes into a document within 24 hours after the interview. Two researchers independently coded the same material using the framework content analysis method(22) and analyzed the interview

data using TDF as the coding framework. In case of disagreement, the research team would discuss and determine the final decision. Throughout the data collection process, self-reflection(23) was conducted to prevent the researcher's personal characteristics, qualifications/experience, and biases from affecting the research results and causing deviations in the results.

2.4 Quality Control

The interviewer was a postgraduate student who had received systematic training in qualitative research courses and had ICU nursing experience. This study followed the principle of maximum difference and selected people of different ages, titles, working years, etc. for interviews to ensure the representativeness of the data. The data collection process flexibly used techniques such as follow-up questions and empathy. In the data analysis stage, two researchers analyzed and verified according to the theoretical domain framework, focusing on the text data from an objective perspective, reading and thinking deeply many times. At the same time, it was reported regularly at the research group meeting and discussed with the members to reach a consensus. After the researchers sorted out the materials, they returned them to the interviewees for verification and supplemented or modified them according to the feedback from the interviewees.

3. Results

When the number of respondents in this study reached 11, no new information emerged, 2 additional nurses were interviewed and no new themes emerged, so the interviews were stopped, numbered N1-N13, and the general information of the interviewees is shown in Table 1. Thru the coding and comparison of the transcribed text, six (knowledge, skills, social/professional roles and identity, environment and resources, social influence, and behavioral norms) barrier factors for medical staff to implement thirst management for critically ill patients were analyzed and extracted.

3.1 Lack of knowledge and skills related to thirst management

Due to the rapid changes in the condition of critically ill patients and the constant risk of life-threatening situations, healthcare professionals must promptly assess the patient's condition and initiate emergency interventions. Therefore, nurses tend to focus more on observing and assessing objective indicators such as vital signs, often neglecting patients' thirst issues. This leads to an inability to promptly identify and address patients' thirst problems. Additionally, most nurses have limited proficiency in assessing and intervening for thirst, resulting in a narrow range of nursing interventions that fail to effectively alleviate patients' thirst.

“Our understanding of knowledge related to thirst management for critically ill patients is fragmented, and we are unclear about how to accurately assess the severity of a patient's thirst. Most of us rely on our own experience.” (N4)

“I observe the patient's lips for dryness or peeling and the condition of their mouth during shift handover, but I do not further assess whether there are symptoms of thirst, the severity of such symptoms, or whether intervention is needed.” (N5)

“During work, we do encounter patients who constantly say they are thirsty and want to drink water. However, sometimes patients are on a no-food, no-water regimen. If consulting the doctor confirms the need to maintain this regimen, we can only comfort them by using a cotton swab dipped in warm water or petroleum jelly to moisten their lips. I am unsure of other possible interventions.” (N7, N11)

“For intubated patients, if I notice they are thirsty, I report it to the doctor and ask whether fluid replacement is needed or if I should moisten their mouth. Personally, I don't have much experience handling such patients. For sedated or minimally conscious patients, I am currently unaware of other specific management methods.” (N3, N10)

“I don’t know how to obtain relevant guidelines and expert consensus, nor how to implement the recommended practices.” (N2)

“Thirst is not easily observable, especially in comatose patients. Sometimes when busy, it may not be considered, or if the patient does not express it, one may not proactively monitor whether the patient is thirsty or wants to drink water.” (N9, N12)

“Compared to other symptoms the patient presents; thirst is not given as much priority. Pain and other symptoms are easier to assess, so thirst is often overlooked.” (N8)

3.2 Weak awareness of thirst management

The social/occupational role identity domain corresponding to this theme is manifested in this study as role ambiguity in thirst management among ICU nursing staff. This is primarily reflected in insufficient collaboration within the medical team.

“Our primary responsibility should be patient treatment and care; thirst assessment and management should be handled by the attending physician.” (N8)

“The assigned nurses change daily, making it difficult to coordinate effectively with the attending physician.” (N3)

“Some doctors primarily focus on patients' vital signs and do not prioritize thirst-related issues. We also have numerous daily tasks and cannot follow up on these matters, so we can only adhere to medical orders.” (N4, N13)

3.3 Human resource constraints and lack of equipment

ICU patients have a high turnover rate and severe conditions. Respondents indicated that daily nursing procedures are numerous, and all aspects of patient care are handled by nurses, who primarily focus on

monitoring vital signs and completing core tasks. The lack of thirst assessment equipment impacts the accuracy of thirst assessment in critically ill patients.

“Our daily work is quite diverse and time-consuming, leaving little time to focus on patients' thirst-related issues. Additionally, many patients are comatose, making assessments challenging, and there are no specialized assessment devices available. For conscious patients who do not express their needs, we would not proactively intervene.” (N1)

“Currently, the nurse-to-patient ratio is difficult to maintain at 1:1, often being 1: many, making it challenging to allocate time to monitor patients' thirst levels.” (N2)

“If we could assign someone specifically to assess thirst and communicate with the attending physician to resolve the issue, the situation would improve significantly.” (N3)

“Sometimes, if the patients we manage are conscious, they will actively say they are thirsty and want to drink water. However, in many cases, we are busy resuscitating patients or performing other treatments and cannot leave, so we can only let them wait and are unable to observe and intervene in a timely manner.” (N6, N11)

“Our work is already very busy, and sometimes we must work overtime to complete tasks. Therefore, actively offering water to patients feels like something beyond our regular nursing duties. We focus more on tasks like ventilator care and monitoring vital signs, so we often overlook observing patients' fluid intake.” (N9, N10)

3.4 Lack of organizational climate and social support

In this study, the lack of organizational atmosphere and social support was evident in the process of managing thirst in critically ill patients. Interviews revealed that the department had not established an atmosphere conducive to thirst management and that interactions among department members led to suboptimal implementation outcomes. Unclear division of labor among healthcare providers, poor communication, and unclear management responsibilities, coupled with the absence of specific implementation plans and management systems tailored to the department's actual circumstances, also hindered nurses' ability to implement thirst interventions.

The department does not require staff to specifically address patients' thirst issues. Typically, if a patient's lips appear dry, staff will use a cotton swab or petroleum jelly to moisturize them. Everyone follows this practice, so there is little focus on addressing patients' thirst issues (N7).

Everyone just wants to finish their shift quickly and go home early. So even if they know patients may have thirst issues, there's simply no time to address it. Even if they want to, when they ask senior nurses, they're told to just moisten the lips or ask family members to buy a spray bottle for intermittent use. No other suggestions are given, so over time, they stop paying attention to the issue (N8, N10).

“Sometimes when reporting to doctors that patients have thirst issues, they just tell us to handle it the old-fashioned way and observe, without any additional measures. It feels like doctors don’t take it seriously either, so I didn’t think much of it either.” (N5)

“Thirst management should be a nursing priority. While monitoring vital signs, we may overlook the patient's comfort. Thirst can also affect other vital signs. The discomfort from thirst can make patients restless, increasing the risk of delirium and post-ICU syndrome, thereby prolonging the treatment process and severely affecting the patient's prognosis. This should be given attention” (N1).

3.5 Lack of implementation plans and regulatory measures

The behavioral norms theory domain corresponding to this theme refers to changes in objective, observable self-regulation processes. In this study, this manifests as the absence of standardized procedures and regulatory measures for thirst management in critically ill patients. Interviews revealed that there are currently no unified operational standards in clinical practice, with most healthcare providers relying on work experience to form specific operational habits. Thirst assessment is not standardized, and there is incomplete knowledge of assessment processes (tools) and intervention measures. Unclear intervention protocols hinder the clinical practice of thirst management in critically ill patients. Interviews suggest that effective regulatory measures would enhance the standardization of thirst management.

“Generally, when we see a patient with dry, peeling lips, we use a cotton swab to wipe them or use a moist cotton ball to wipe the mouth. Sometimes we also use petroleum jelly, but we don’t know how to assess the severity of thirst, how long the effect of wiping lasts, or how often we need to reassess and intervene—there are no unified requirements for this.” (N6, N13)

“The department currently lacks standardized guidelines for thirst assessment. When busy, staff often neglect to assess patients' thirst levels or determine the need for timely intervention, instead relying on personal experience.” (N4)

“During departmental training sessions, the importance of thirst management is mentioned, but there are no detailed operational guidelines to reference, and the effectiveness of thirst management is difficult to evaluate.” (N2)

4. Discussion

This study found that healthcare professionals lack knowledge and skills in managing thirst in critically ill patients, leading to insufficient awareness among some healthcare professionals regarding thirst management in critically ill patients. In the current nursing education system, cultural competence training has been proven to significantly enhance nurses' cross-cultural sensitivity and clinical decision-making abilities(24, 25). However, specialized teaching content on thirst management in critically ill patients remains significantly lacking in nursing curricula in China. Theoretical instruction primarily focuses on oral disease prevention (e.g., saline wipe techniques) rather than proactive intervention for

thirst symptoms, resulting in nurses' insufficient understanding of the pathophysiological mechanisms of thirst and individualized relief strategies (8, 26), which poses challenges for clinical implementation. Enhancing healthcare professionals' awareness of thirst management is a crucial foundation for conducting thirst management initiatives. ICU nurses primarily acquire knowledge about thirst through clinical practice, professional lectures, academic conferences, and peer exchanges. Among the desired supplementary channels, specialized training, expert lectures, and practical experience enhancement rank among the top three. This indicates that nurses seek to deepen their understanding through systematic training and theoretical learning and integrate this knowledge with clinical practice. Therefore, it is recommended to systematically advance specialized training on thirst management for ICU patients while consolidating practical exchanges and academic activities to comprehensively enhance nursing staff knowledge.

From a social influence perspective, a poor organizational atmosphere is one of the primary barriers to thirst management. Interference among team members, herd mentality, and inefficient collaboration patterns hinder the standardized implementation of thirst intervention measures. Related studies confirm that healthcare personnel are easily influenced by organizational environments when implementing thirst management, such as colleagues' negative attitudes or differences in process execution forming implicit constraints that weaken nursing compliance(26, 27). The interview results of this study further indicate that phenomena such as new members being assimilated and neglecting thirst assessment, as well as gaps in multidisciplinary collaboration, are prevalent in ICU nursing teams. The fundamental cause lies in the lack of emphasis on thirst management by management. It is recommended that department leaders incorporate thirst management into the new employee training system, strengthen team consensus through regular case discussions and standardized process drills, thereby enhancing intervention confidence and quality. Optimizing human and material resource allocation and regulatory processes for thirst management in critically ill patients requires evidence-based practice to integrate multi-dimensional resources and establish a standardized system.

In terms of human resource allocation, the results of this study also confirm that excessive workloads are the primary reason ICU nurses neglect thirst issues. Under China's closed management model for ICUs, nurses are responsible for all daily care tasks, which are complex and physically and mentally exhausting, directly leading to a decrease in the implementation rate of thirst interventions(27). In response, Shaanxi Province in China issued the “Implementation Plan for Strengthening the Construction of Critical Care Medical Service Capabilities,” explicitly requiring medical institutions to “equip critical care specialists according to standards” and “prioritize critical care medical staff,” while establishing performance evaluation and incentive mechanisms for critical care nursing positions. This aims to alleviate workload pressure through flexible human resource allocation and the establishment of dedicated positions. A multicenter trial(28)further validated the feasibility of the “human-machine collaboration” model, where smart devices monitor physiological indicators (such as heart rate and oxygen consumption) in real time, freeing nurses from basic monitoring tasks and allowing them to focus on personalized interventions. This model increased patient compliance by 40% and reduced readmission rates by 32%. Resource allocation must combine technological innovation with spatial

optimization. The Department of Critical Care Medicine at Shanxi Cancer Hospital in China adopted the “oral spray method” to alleviate thirst. The 50-100ml sprayer is inexpensive but highly effective, with mist droplets evenly covering the oral mucosa to reduce the risk of lip cracking and infection. The Chegu Campus of Peking Union Medical College Hospital has established a “thirst-free ward” pilot program, integrating non-pharmacological measures such as ice stimulation therapy and warm water misting(29)for thirst management, effectively improving patients' thirst conditions. Regulatory processes and institutional frameworks must be based on standardization. Therefore, managers should address the negative effects of excessive workloads on nurses, regularly organizing psychological support activities to alleviate occupational stress and thereby enhance work enthusiasm. Additionally, hospital management should focus on improving the nursing support system, scientifically allocating nursing staff, and creating a healthy and orderly professional environment to ensure the sustainability of high-quality nursing services.

5. Limitations

The respondents in this study were only from one hospital, so the results may have certain limitations. Further multicenter clinical studies are needed to validate the findings. In the future, multi-center investigative studies combining quantitative and qualitative methods could be conducted based on this study to validate the results and provide reference and inspiration for managers.

6. Conclusion

This study, based on a theoretical domain framework, identified six theoretical domain components related to barriers to thirst management behaviors among ICU nurses caring for critically ill patients. These findings provide a reference for setting goals for future clinical improvements, further standardizing ICU nurses' thirst management behaviors for critically ill patients, optimizing the thirst management process for critically ill patients’ post-surgery, and narrowing the gap between evidence-based thirst management practices and clinical practice for critically ill patients.

Declarations

Acknowledgements

The authors would like to thank all nurses who participated in this study

Author contributions

All authors made significant contributions to the conception of the article, the design and execution of the study, and the acquisition, analysis, and interpretation of the data. n the end, the version of the article for publication was unanimously endorsed and approved for submission to the journal. It was also agreed to assume responsibility for the content of the text.

Funding

The authors did not receive any funding for this study.

Data availability

Data cannot be obtained from a third party and are not publicly available. The full dataset and data analysis code following receipt of ethics approval may be available from the corresponding author JYC.

Ethics approval

The study was conducted in accordance with the Declaration of Helsinki. Ethical clearances and approvals were secured from the Ethics Committee of Puning People's Hospital (Puning People's Hospital Ethics Review [2025] No. 28). Informed consent was obtained from all study participants. Principles of voluntary participation, privacy, and confidentiality were observed. Only anonymous data were collected and analyzed.

Consent for publication

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests

Supplementary Information

Additional file 1: Appendix 1.

Interview Guide.

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Supplementary Files

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- Appendix1..docx