



## Research Article

## A qualitative study of nurses' perception on patients' thirst in intensive care units

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## ABSTRACT

**Background:** Thirst is a prevalent and intense symptom among patients in intensive care units. Occurrence of thirst in the intensive care unit cannot be avoided because of the nature of critical illnesses and their treatments like the side effects of administered medication or dehydration. In the intensive care unit, nurses have the opportunity and responsibility to prevent and reduce thirst by recognizing the different types of thirst. Thus, knowing nurses' perception on patients' thirst is crucial.

**Objectives:** Exploration of intensive care nurses' perception on patients' thirst.

**Research design:** A qualitative descriptive study.

**Methods:** Data were collected from December 2020 to January 2021 and analyzed by using a phenomenographic methodology. Data were transcribed verbatim and thematic analysis was performed.

**Results:** Sixteen nurses, in Chongqing, China, aged 25–48 years, were interviewed. Four themes emerged: (1) perceived barriers for thirst; (2) perceived signs of thirst; (3) perceived reasons of thirst; (4) perceived consequences for thirst. Overall nurses' perception of patients' thirst is poor. Nurses give a low priority and insufficient attention to the issue of thirst in intensive care patients.

**Conclusion:** Intensive care nurses' perception on thirst in patients should be evaluated and, if necessary, this issue should be given more attention in training in order to create sufficient awareness about the topic.

## Implications for clinical practice

- Nurses need to be aware that thirst is a common discomfort symptom in intensive care patients.
- Factors significantly affecting the patients' thirst include environment (e.g. air humidity), treatment (e.g. opioids, ventilation), physiological and psychological factors (e.g. anxiety, fear).
- Regular assessments should be implemented to detect patients' thirst.

## Introduction

Thirst is a perception that provokes a need to drink fluids (Puntillo et al., 2014). It is a threshold symptom indicative of fluid imbalances

stemmed from dehydration or increased plasma solute concentration. In theory, a 1% increase in osmolality may trigger sensations of thirst (Hughes et al., 2018).

Thirst is a prevalent, intense, distressing symptom in intensive care unit (ICU) patients (Puntillo et al., 2014). Research indicated that thirst is the second most common and the most intense symptom in ICU

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patients (Puntillo et al., 2010). Schitteck et al. identified dry mouth (35.4%) as the most frequently reported early postsurgical disturbances by patients in Post Anaesthesia Care Unit (PACU), followed by pain (12.7%) (Schitteck et al., 2020). In the study by Zengin et al., 50.9% of ICU patients reported thirst (Zengin et al., 2020). Magaraey et al. asked in their study 50 patients to recall their ICU treatment and approximately one third reported thirst. Moreover, among these patients, 60% reported frequent thirst and 13% constant thirst (Magarey and Mccutcheon, 2005).

Thirst is also identified as one of the greatest stressors for ICU patients. Xie et al. found that thirst is a key factor affecting patient's discomfort by investigating 185 ICU patients (Xie et al., 2016). Gültekin et al. found that the most negative stressor affecting the ICU patients is thirst, because it affects patients' well-being negatively (Gültekin et al., 2018). Nelson et al. found that thirst is rated as an intenser stressor than fatigue, anxiety, restlessness, hunger, dyspnea, pain, sadness, fear, and confusion (Nelson et al., 2004). Meanwhile, Kjeldsen et al. could identify with qualitative interviews of 12 patients that patients associate their feelings of desperation, anxiety and powerlessness with the experience of thirst (Kjeldsen et al., 2018). In addition, recent research indicates that thirst is a well-being threat also for critically ill COVID-19 patients (Schitteck et al., 2021). Critically ill who experience thirst have an increased risk of developing delirium and thus are more likely to cause adverse events such as unplanned extubation (Sato et al., 2019). These adverse events have a negative impact on patients' recovery. Thirst, like pain, nausea, vomiting and cold, is a common challenge of well-being in patients (Schitteck et al., 2021; Schitteck et al., 2021). Detecting and relieving thirst of patients in ICU has increasingly been paid more attention.

At present, oral care is recognized as an important method to preserve oral moisture (Atay and Karabacak, 2014). Puntillo et al. implemented an intervention bundle consisting of ice water spray, oral swab wipes, and menthol lip moisturizer to prevent patients in ICU from thirst and dry mouth (Puntillo et al., 2014). However, some researchers postulate that patients still have discomfort caused by thirst despite scheduled intervention. VonStein et al. evaluated in a quasi-experimental study the effectiveness of scheduled care with ice water oral swabs and lip moisturizer with menthol compared to unscheduled use in relieving thirst and dry mouth for ICU patients. They could identify that scheduled care might lessen thirst intensity and dry mouth in ICU patients (VonStein et al., 2019). In ICU, most patients have poor ability to take care of themselves and are severely weak. Nurses in ICU need to conduct multiple procedures such as skin management, and living care. Compared to other units, nurses in ICUs have more workload per patient. There is no doubt that taking scheduled oral care will further increase the work stress of nurses in ICUs. Research indicates that the work stress of nurses in ICUs and high quality nursing are associated with suboptimal nurse to patient ratios (Falk and Wallin, 2016). To ensure the quality of nursing, the guideline for the construction and management of critical care medicine of China (2006) recommends that the nurse to ICU-bed ratios (the total number of nurses to ICU-beds) should be no less than 3 to 1 (Chinese Society of Critical Care Medicine, 2006). In Chongqing Municipality, China, the population is 32,054,159 in 2020 according to the National Bureau of Statistics, account for 2.27% of total population (National Bureau Statistics of China, 2021). There are 994 ICU-beds, with nurse to ICU-bed ratios and physician to ICU-bed ratios of 1.7 to 1 and 0.6 to 1 respectively (Liu et al., 2017). It is common that the nurse to ICU-bed ratios is less than the required ratios in China. Scheduled oral care has a low priority due to the imbalance of nurse to patient ratios and the high workload. Possible risk factors of thirst include the administration of high doses of opioids, having a gastrointestinal disease, and receiving mechanical ventilation (Stotts et al., 2015). Despite the possible benefit from scheduled oral care (VonStein et al., 2019), due to limited resources and high workload, taking an assessment accurately and timely seems realistic.

Assessment is an important part of medical process, it can accurately reflect the patients' current status as well as any changes and provide an objective basis for diagnosis and treatment (Ding et al., 2019). Correct assessment can not only solve the problem for patients in time but also avoid additional workload. In China, most ICUs are closed, instead of being accompanied by their family, patients are cared for by nurses in ICU. Thus, nurses are responsible for assessing and relieving patients' thirst by recognizing different types of thirst, identifying if patients are at a risk of thirst, monitoring physiological parameters, and providing comfort measures (Woodtli, 1990). However, in clinical work, patients' thirst has not been routinely assessed and even been ignored (Chanques et al., 2015). The implementation of nursing assessment depends on their perceptions regarding patients' symptoms. To our knowledge, the research about the perception of nurses on patients' thirst in ICU attracts limited attention. The objective of this study was therefore to explore nurses' perception on thirst in ICU patients so as to provide an intervention strategy.

Methods

Objectives

Exploration of nurses' perception on ICU patients' thirst.

Setting

The interviewers recruited ICU nurses from different hospitals in Chongqing, China.

Ethical approval

This study was approved by the clinical research ethics committees of the First Affiliated Hospital of Chongqing Medical University (Approval NO. 2021-232). Verbal and written informed consent were obtained, and all participants received information regarding their right to withdraw their participation at any time without giving a reason.

Participants

Purposeful sampling was carried out so that the recruited participants could provide rich data about thirst of ICU patients. The included criteria are: (1) participants are registered nurses, (2) nurses with more than one year of work experience in ICU. In order to provide a representative sample, the nurses came from different hospitals in Chongqing, China. Sample size was determined by theme saturation (Hsieh and Shannon, 2005).

Data collection

Data were collected from December 2020 to January 2021. An interview was guided by four open-ended questions about thirst in ICU patients. The questions were developed based on literature reviews and nurse experts of ICU. The interview was guided by a pilot-test on five nurses to ensure that participants could understand the language and related concepts. After the pilot-test, only few minor changes were made, and the final version of the four open-ended questions are shown in Table 1.

Table 1  
Interview questions.

| No. | Questions                                                       |
|-----|-----------------------------------------------------------------|
| 1   | "What's your perception on patients' feeling of thirst in ICU?" |
| 2   | "What factors cause patients' thirst?"                          |
| 3   | "Do you care about patients' thirst?"                           |
| 4   | "What will happen when ICU patients feel thirsty?"              |

The semi-structured and face to face interviews were conducted by the first author who had more than one year's clinical working experience as a nurse in ICU. Participants were interviewed in a private and quiet meeting room. Because of COVID-19 protection measures, interviewer and interviewees wore a mask during the interview. Interviews began with some general questions, followed by more ICU related ones.

The interviews began with the participants' verbal and written informed consent. Each interview lasted between 10 and 30 minutes. During the interview, the interviewer took notes on participants' nonverbal behaviour. After 16 interviews, data collection was complete and the interviews ended. Each interview was tape-recorded and then transcribed verbatim within 24 hours.

### Data analysis

Audio-tapes were transcribed verbatim within 24 hours after each interview. The researchers in the group checked the content of the transcription independently to ensure its accuracy. Data were applied to the thematic analysis including coding, grouping codes, summarizing codes into categories, and identifying themes (Waltz et al., 2010). Firstly, the first author read each transcript carefully to gain the insight into the perception of participants. Secondly, the meaningful words and sentences of each transcript were coded. Based on the similarities of meaning, the codes identified in each transcript were summarized into group codes. Thirdly, all the members in the research group reviewed the group codes and summarized their categories. Finally, the themes and subthemes based on the codes and categories were refined.

### Rigour

Firstly, open-ended questions were used to ensure trustworthiness of qualitative data. Secondly, during the analysis, two researchers read the transcripts independently and identified the themes and categories. Finally, at the end of data analysis, the researchers compared and contrasted the themes and categories. Debate and discussion were allowed and continued until a consensus was reached.

### Results

A total of 16 nurses participated in the interview. 93.75% of the participants were female with a mean age of 32.68 years old (SD = 6.47). Participants' work experience ranged from 1 to 21 years (mean = 9.06, SD = 6.30). 68.75% of the participants were senior nurses, and their general demographic data are listed in Table 2.

**Table 2**  
General characteristics of the participants(N = 16).

| Characteristics            | N  | %      |
|----------------------------|----|--------|
| <b>Age(years)</b>          |    |        |
| 20~29                      | 5  | 31.25% |
| 30~39                      | 8  | 50.00% |
| 40~49                      | 3  | 18.75% |
| <b>Sex</b>                 |    |        |
| Male                       | 1  | 6.25%  |
| Female                     | 15 | 93.75% |
| <b>Educational level</b>   |    |        |
| Graduate                   | 1  | 6.25%  |
| Undergraduate              | 13 | 81.25% |
| Junior college             | 2  | 12.50% |
| <b>Title</b>               |    |        |
| senior                     | 11 | 68.75% |
| Intermediate               | 4  | 25.00% |
| Senior                     | 1  | 6.25%  |
| <b>Years of experience</b> |    |        |
| ≤5                         | 5  | 31.25% |
| 5~10                       | 5  | 31.25% |
| ≥10                        | 6  | 37.50% |

**Table 3**

Themes and subthemes describing perception of nurses on thirst in ICU patients.

| Themes                            | Subthemes                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Perceived barriers for thirst     | Sedated patients with no feeling of thirst<br>Thirst as an unimportant nursing problem<br>No perception of patients' thirst<br>Side effect                               |
| Perceived signs of thirst         | No methods to solve thirst<br>Chief complaint and behaviours<br>Dry lips and skin<br>Sticky sputum<br>Changes in blood<br>Imbalance of input and output                  |
| Perceived reasons of thirst       | Physiological and psychological factors<br>Treatment<br>Environment in ICU                                                                                               |
| Perceived consequences for thirst | Irritability in patients<br><br>Change of consciousness<br>Adverse event<br>Influence on relationship between patient and nurse<br>Resistance to treatment from patients |

Four themes and eighteen subthemes emerged from the analysis. The themes and subthemes are presented below with illustrative quotes. See Table 3 for an overview of all the themes and subthemes.

#### Perceived barriers for thirst

The perceived barriers of nurse on thirst in ICU patients included nurses' factors and patients' factors. For nurses' factors, many participants perceived that sedated patients had no feeling of thirst. Some participants referred to that thirst was not an important nursing problem and almost never been mentioned during the handovers or documented in the nursing care plans.

*"Generally, there is no concern about the sedated patients' thirst, because they are intubated and they don't feel thirsty..."(N4)*

*"In ICU, thirst can't affect the vital signs of the patients."(N5)*

*"Doctors calculate the input and output of fluid for patients, so it is not necessary to focus on the patients' feeling of thirst."(N14)*

In addition, more than a quarter of the participants had no perception on thirst in ICU patients, especially for the patients who couldn't express their feelings of thirst.

*"Our work is busy and the staff number is not enough, so we focus on the other tasks rather than the patients' feeling of thirst." (N8)*

*"Thirst is a subjective feeling of patients. If patients didn't express their wishes, we don't know whether patients are thirsty or not."(N5)*

*"I don't pay special attention to the thirst of patients. For example, for patients with severe infection, I pay more attention to medication instead of thirst." (N9)*

As for patients with orotracheal intubation, participants claimed that drinking often caused choking cough or aspiration. Many patients had fluid restrictions, consequently, participants had no method to solve patients' thirst.

*"For patients with orotracheal intubation, they have a risk of choking cough or aspiration if I gave them water."(N1)*

*"If a patient had fluid restriction, I just moisten his/her mouth with water or lubricate his/her lip, and I can't do anything else."(N4)*

### Perceived signs of thirst

Reported signs were divided into two classifications. One was the chief complaint and behaviour, the other was the physiological sign.

*"For conscious patients, they can express their wishes, knock the bed, or pull the face mask of noninvasive ventilator to tell us that they want to drink water."* (N1)

Physiological signs included dry lips and tongues, sticky sputum, high levels of sodium in blood sample, and/or high production of urine.

*"When patient's lip and skin are dry or the fluid of the patient's input is less than output, the patient may be thirsty."* (N11)

*"Observing whether the sputum of patients is sticky or not."* (N10)

### Perceived reasons of thirst

The reasons for thirst included physiological factors, psychological factors, treatment and ICU environment. Reported physiological factors included fever and some diseases.

*"When patients have fever and sweat a lot, they may be thirsty."* (N2)

*"In ICU, patients with pancreatitis, gastrointestinal bleeding, shock, or diabetic ketoacidosis often feel thirsty."* (N12)

The perceived psychological reasons were anxiety, fear and the fact that drinking water was a basic human need.

*"Patients may feel fear and anxiety in unfamiliar environments, which may trigger thirst."* (N13)

*"I think water is a basic human need."* (N15)

External factors for thirst included ICU environment and treatment.

*"In terms of the environment, I think the humidity of ICU doesn't reach the ideal state. Not only the patients, we also feel dry."* (N15)

*"For example, patients with noninvasive ventilator are often thirsty. Patients treated with CRRT also feel thirsty."* (N2)

### Perceived consequences for thirst

The perceived consequences for thirst included the change of consciousness, and adverse events. In addition, patient might become irritable.

*"Some patients are irritable because of the disease. If they were not given water, they become more irritable...Some of them may pull out the tube..."* (N8)

*"When the patient is thirsty, the patient starts being hyperactive, subsequently, the patient continues to be hyperactive, drowsy or even delirium."* (N13)

*"Being falling down from bed, unplanned extubation...Previously, we had a patient with gastrointestinal bleeding. He was thirsty, but he was not permitted to drink water. Then, he jumped out of bed and looked for water to drink..."* (N12)

In addition, participants referred that if thirst was not relieved, it could affect the relationship between medical staff and patients. Some patients even rejected treatment because of thirst.

*"Some patients were transferred out of ICU, they said that 'Those nurses aren't nice at all. I wanted to drink water but they refused.'"* (N11)

*"Those patients who aren't permitted to drink water are particularly resistant. Those patients think that drinking water is a basic human need"*

*and it is very simple. If we don't give them water, they won't be cooperative for the treatment."* (N15)

## Discussion

ICU patients often experience discomfort. Lack of fulfilment of patients' needs is a basic trigger of discomforts in ICUs (Ashkenazy et al., 2021). Thirst is a common symptom, but sometimes it is ignored during nursing, which results in serious discomfort among ICU patients. Therefore, relieving patients' thirst is a key point to decrease the discomfort and it should be paid enough attention. This study was conducted to explore the perception of nurses on thirst in ICU patients. The outcomes were combined in four themes: perceived barriers for thirst, perceived sign of thirst, perceived reason of thirst, and perceived consequences for thirst.

First, several barriers of perceiving thirst of patients were referred by the participants. These barriers were related to the participants with little consciousness for relieving patients' thirst. Most participants pointed out that relieving patients' thirst was not important at all or they had no perception on patients' thirst. The reasons are as follows. (1) In ICU, the condition of patients is serious and nurses mainly focus on the vital signs. (2) In ICU, nurse to bed ratios does not meet the government's required ratio of 3 to 1. Liu et al. investigated ratios of nurse to ICU-bed in Chongqing and found that the ratio was only 1.7 to 1 (Liu et al., 2017). There are so many nursing practices but without enough nurses, it is easy to ignore satisfying patients' comfort needs such as thirst. (3) Thirst, which is a representation of fluid imbalance, is influenced by the input and output of fluid that is responsible by doctor. This is another reason that nurse ignores patients' thirst. In fact, doctors pay more attention to the thirst caused by the physiological index rather than psychological factors. Sometimes, psychological factors including anxiety and fear trigger patients' feeling of thirst. (4) Little training is about relieving patients' thirst, which leads to nurses' lacking awareness of this phenomenon. Most training is about decreasing adverse events and, the prevention and control of nosocomial infection, while patients' thirst is ignored. To sum up, in order to improve the comfort of the patients, two measures should be taken: (a) popularize the knowledge of relieving patients' thirst so as to improve nurses' attention, and (b) increase nursing staff levels to ensure nursing quality.

In addition, many participants had incorrect perception on thirst. The reasons mentioned by participants are summarized as follows. (1) They have no method to relieve patients' thirst. (2) Drinking water can cause unfavourable side effects among patients. (3) Sedated patients have no feeling of thirst. In China, nurses always use foam swabs and mouth rinse containing saline, antibiotics or disinfectants to take oral care for patients, in an effort to reduce the rate of ventilator-associated pneumonia rather than for preserving oral moisture (Qu et al., 2015). When patients feel thirsty and they have fluid restriction, nurses have no method to solve it. In fact, there are many methods to solve the thirst of patients with fluid restriction in previous study, such as ice water spray, oral swab wipes, glycopyrronium and 0.75% Citric Acid Spray (Puntillo et al., 2014; Schitteck et al., 2021; Wu et al., 2021). However, these methods that can relieving patients' thirst are not known by most nurses and should be popularized. Participants thought that drinking water would increase the risk of choking cough or aspiration for those patients with orotracheal intubation. Indeed, keeping appropriate cuff pressure of the artificial airway can avoid the risk of choking cough or aspiration. Sedated patients cannot express their feelings of thirst. Consequently, nurses usually ignore sedated patients' feelings of thirst even if many of these patients have dry lips and skin.

Second, the perceived signs of patients' thirst were chief complaint, behaviours and physiological signs. Landstroma et al. pointed out that anxiety behavior, which is easily misinterpreted as pain in ICU, may lead to more opioid's administration that causes a further increase in thirst (Landström et al., 2009). In this study, some physiological signs were

identified as the signs of thirst. Doi et al. found that objectively dry mouth assessment did not contribute to assessing patients' perception (Doi et al., 2021), because the physiological signs are late signs of thirst. As an essential part, frequent assessment of thirst perception is necessary.

Third, the reasons of the patients' thirst perceived by participants were treatment, physiological, psychological and external factors. Stotts et al. found that thirst presence of patients in ICU was predicted by high opioid doses and high furosemide doses while thirst distress was predicted by mechanical ventilation and antihypertensive medications (Stotts et al., 2015). It is important to note that nurses need to recognize patients' risk of thirst and provide correct oral care early. Most ICUs in China are closed and medical equipment is in various places. ICU Patients are often not accompanied by their family. This situation can cause fear and anxiety, which contributes to patients' feeling of thirst (Waldreus et al., 2018). Evidently, the air humidity in the ICU has a great impact on the comfort of patient. In some hospitals especially in developing countries, the air humidity is poorly controlled. Furthermore, Esma et al. found that humidity in ICUs was typically controlled for the comfort of staff rather than a patient's condition (Simsek et al., 2017).

Fourth, approximately half of the participants perceived some consequences when a patient was thirsty. Unplanned extubation was one of the adverse consequences, which was mentioned most frequently by participants. Thirst is a typical factor that affects physical discomfort of patients (Aroni et al., 2020). Discomfort often leads to agitation and even irritability of patients. In this case, nurses usually conduct physical restraint for patient to avoid unplanned extubation. However, conducting physical restraint has been identified as a risk factor of unplanned extubation (Ai et al., 2018). Furthermore, participants revealed that thirst affected the relationship between the nurse and patient. For some patients, thirst relief is a key issue to judge nursing quality. Medical quality is a factor that affects the relationship between medical staff and patients (Li et al., 2021). Therefore, improving medical quality is a way to protect the relationship. In this study, participants explained that patients rejected treatment when feeling thirsty. In other words, patients may think treatment is meaningless when their basic needs are not fulfilled. In this study, participants mentioned that patients with persistent thirst would appear delirious as reported by Sato et al. (Sato et al., 2019). Studies on elderly medical patients reported that dehydration was a risk factor for delirium (Lawlor, 2002). Above all, these adverse consequences can be avoided if thirst was detected early and interventions were taken timely.

## Limitations

This study has limitations. First, because of the sampling methodology, there was an inherent risk of bias during the recruitment of study participants. Second, we only choose the interviewees from hospitals located in Chongqing, China. Although the data saturation is reached, the findings may not represent all views of nurses in China. Finally, all the participants work in mixed ICUs, which may not represent the perception of nurse on patients' thirst in specialized ICUs.

## Conclusion

In this study, four themes of perception of nurses on thirst in ICU patients could be identified: perceived barriers for thirst, perceived signs of thirst, perceived reasons of thirst, and perceived consequences for thirst. We revealed that in Chongqing's ICUs, nurses attention and knowledge on ICU patients' thirst should be improved. To solve this problem, adequate staffing levels should be provided ensuring an optimal standard of nursing care. Furthermore, focused training on thirst assessment and relief should be organized.

## Ethical statement

Research Ethics Committee's approval for the study was granted by the Ethics Committee, the First Affiliated Hospital of Chongqing Medical University (2021-232). Informed consent was obtained from all participants prior to the interviews. Participants were free to withdraw from the study at any time.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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