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# Qualitative study on the description and status analysis of midstream urine retention difference in ethnic regional hospitals

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***Abstract:*** *Objective: To understand the difference between outpatient and inpatient patients in ethnic areas, and to study the status of the middle urinary retention system and its solutions. Methods: Face-to-face and semi-structured interviews surveyed 148 respondents and the survey data were described. A total of 39 patients were randomly selected: 20 outpatient and 19 inpatient cases for main study discussion, content analysis and topic analysis. Results: The interview data were summarized into 4 themes and 9 subthemes: information acquisition disorder, negative factors in middle section retention, significant differences in urine sample collection behavior, and medical treatment Test badly. Conclusion: outpatient and inpatient cognitive understanding and mastery degree have significant differences ($p < 0.05$), most patients lack of knowledge, information access way single, cognitive behavior deviation, initiative, medical experience, cause patients unable to correctly for middle urine, the specimen quality and follow-up examination brings great negative impact.*

***Keywords:*** *middle urine; middle urine retention; difference; mastery of medical knowledge*

## 1. Introduction

Urine specimen culture is a common specimen collection item in urology [1], and also one of the auxiliary analysis tools for other diseases. Timely and effective retention and submission of mid-stage urine samples have important clinical significance for the diagnosis, treatment and curative effect judgment of urinary tract diseases. At the same time, the relevant literature pointed out that the retention method of middle urine would significantly affect the culture results [2]. Incorrect and nonstandard urine retention methods may lead to false positive or false negative results, which will affect doctors' diagnosis and treatment, delay the patient's condition, and also cause a waste of resources.

At present, there are many items for examination of urine samples, and the retention methods are different [3]. The precautions for retention of urine for different populations are also different, and the pollution rate of retention of urine samples is increasing. This may be related to the insufficient attention paid by doctors and nurses, the low level of popular science publicity, the single access to public knowledge, the deviation of personal understanding and cognitive behavior, and the lack of behavioral initiative; At the same time, urine samples often need to be collected by patients themselves. Some patients are older, less educated, and have poor understanding ability, which leads to their inability to grasp the correct way, method, and precautions to keep and take middle urine samples, which significantly increases the pollution rate and unqualified rate of samples. This situation is more obvious in ethnic regional hospitals with poor equipment and low cultural level of the masses. By the end of 2021, there were 1,030,935 medical and health institutions nationwide, an increase of 8,013 over the previous year [4]. The proportion of hospitals in ethnic regions is large and growing rapidly. The number of patients is large and the composition of personnel is complex. The qualified rate of urine samples should be paid more attention. In view of the above situation, this study adopts a qualitative research method, aiming to deeply understand the understanding degree of inpatients and outpatients in ethnic regional hospitals on the methods and precautions for retaining and taking urine samples, and provide theoretical basis for improving the quality of urine culture samples in the middle section.

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## 2. Object and Method

### *2.1 Research objective*

*Table 1: General information of outpatients (n=20)*

| numbering | gender | age | ethnic group | marital status | Education | occupation | Number of urines | underlying medical conditions | medical background |
|---|---|---|---|---|---|---|---|---|---|
| A1 | man | 35 | Chinese | married | college | freely | 0 | not | not |
| A2 | woman | 22 | Chinese | unmarried | undergraduate | student | 4 | not | Yes |
| A3 | woman | 33 | strong | married | undergraduate | Migrant work | 5 ~ 6 | not | not |
| A4 | woman | 45 | Chinese | married | junior high school | Migrant work | 3 | not | Yes |
| A5 | woman | 21 | strong | unmarried | undergraduate | undergraduate | 2 | allergic rhinitis | Yes |
| A6 | man | 22 | Chinese | unmarried | undergraduate | student | 1 | not | Yes |
| A7 | man | 60 | Chinese | married | high school | retire | 10 | cancer | not |
| A8 | woman | 33 | Chinese | married | Master | teacher | 5 | not | not |
| A9 | woman | 47 | strong | unmarried | undergraduate | Migrant work | 5 | not | not |
| A10 | man | 41 | Chinese | married | college | individual | 2 | not | not |
| A11 | woman | 29 | Chinese | unmarried | undergraduate | Public officials | 5 | not | not |
| A12 | woman | 41 | Chinese | married | junior high school | individual | 3 ~ 4 | not | not |
| A13 | woman | 22 | Chinese | unmarried | undergraduate | student | 1 | not | Yes |
| A14 | man | 36 | strong | undergraduate | Migrant work | Migrant work | 15 | not | not |
| A15 | man | 46 | strong | married | junior high school | farm | 5 | aneurysm | not |
| A16 | woman | 20 | strong | unmarried | high school | not | 1 ~ 2 | not | not |
| A17 | woman | 41 | Chinese | married | elementary school | farm | 3 ~ 4 | not | not |
| A18 | woman | 22 | strong | unmarried | undergraduate | student | 1 | not | Yes |
| A19 | woman | 22 | strong | unmarried | undergraduate | student | 2 | not | Yes |
| A20 | woman | 24 | strong | unmarried | undergraduate | student | 2 | not | Yes |

*Table 2: General information of inpatients (n=19)*

| numbering | gender | age | ethnic group | marital status | Education | occupation | Number of urines | underlying medical conditions | medical background |
|---|---|---|---|---|---|---|---|---|---|
| B1 | man | 59 | strong | married | junior high school | farm | 4 ~ 5 | not | not |
| B2 | woman | 40 | Commoner | married | elementary school | individual | 4 | kidney stone | not |
| B3 | woman | 22 | Chinese | unmarried | undergraduate | student | 1 | allergic rhinitis | Yes |
| B4 | man | 25 | strong | unmarried | undergraduate | Public officials | 2 ~ 3 | not | not |
| B5 | man | 67 | strong | married | elementary school | farm | 10 | prostatitis | not |
| B6 | woman | 22 | strong | unmarried | undergraduate | teacher | 5 | kidney stone | Yes |
| B7 | woman | 37 | strong | married | Technical secondary | Migrant work | 1 ~ 2 | not | not |
| B8 | man | 64 | strong | married | elementary school | Migrant work | 2 | kidney stone | not |
| B9 | woman | 41 | Chinese | married | Vocational college | not | 5 | kidney stone | not |
| B10 | man | 68 | Chinese | married | junior high school | Migrant work | 4 | not | not |
| B11 | man | 43 | Chinese | married | junior high school | farm | 5 ~ 6 | Urinary tract stones | not |
| B12 | man | 61 | Chinese | married | junior high school | not | 5 ~ 6 | kidney stone | not |
| B13 | woman | 29 | Chinese | unmarried | Technical secondary | Customer | 3 | not | not |
| B14 | woman | 53 | Yao | married | elementary school | not | 3 | kidney stone | Yes |
| B15 | woman | 66 | strong | widowed | elementary school | farm | 3 ~ 4 | Adrenal adenoma | not |
| B16 | man | 35 | seedling | married | Technical secondary | farm | 1 | kidney stone | not |
| B17 | man | 71 | strong | married | junior high school | Retired worker | 5 ~ 6 | Adrenal cysts | not |
| B18 | woman | 38 | Chinese | divorce | undergraduate | employee | 6 | Urinary tract stones | not |
| B19 | woman | 43 | Chinese | unmarried | undergraduate | electrician | 5 | Uterine fibroids | not |

By using the maximum difference sampling method [5], through simple interviews with 148 patients in the wards and clinics of the affiliated hospital of Youjiang Medical College for Nationalities and the People's Hospital of Baise, we can understand their level of knowledge about the correct retention of urine samples and use it as an indicator of the maximum difference sampling, taking full account of differences in gender, age and education. Inclusion criteria: (1) having the experience of taking urine samples for one or more times; (2) patients can fully express their inner feelings and voluntarily participate in the interview. Exclusion criteria: (1) cognitive or communication barriers. (2) Those with

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serious complications or diseases. (3) Withdrawal during the interview. 20 representative outpatients and 19 inpatients were randomly selected for the main study. See Table 1 and Table 2 for the general information of the study object.

### *2.2 Method*

The face-to-face and semi-structured interview method [6] [7] was used to collect data, and SPSS 26.00 was used to analyze the differences of research objects. When recruiting subjects, inform them of the purpose, content and interview method of the study, and specify the form of data collection, confidentiality principles and the rights of the respondents. All interviews obtained the informed consent of the subjects and signed the informed consent form, and kept the basic information of the interviewees confidential, and the private part of the paper record and electronic recording of the conversation was de-privatized. Based on a comprehensive review and summary of a large number of Chinese and foreign literature, and for the purpose of the study, the interview outline of the final version is formed by combining the 10 pre-interviews conducted in the early stage.

(1) Have you ever collected urine samples? How many times have they been retained in the past five years? (2) Do you have any knowledge before your first urine retention? How did you get the knowledge of urine retention? (3) Can you understand the steps they taught you? (4) How do you operate? Do you know the specific operation precautions? (5) How do you judge the correctness of your urine retention method? (6) Have you considered the impact if the method is wrong? (7) What are your experiences (difficulties) in this process? (8) If you have doubts (difficulties) in the process, what help would you seek? (9) Do you know the purpose of specimen retention? Will you take the initiative to understand? (10) Do you have any suggestions on the current education system and devices for urine retention?

Before the interview, ask the interviewees' wishes and make a recording request. During the interview, complete the necessary questioning, retelling and summary according to the interview outline. The interview time is 10 to 30 minutes, and then complete the interviewees' general information. After the interview, the obtained interview content is de-privatized to form notes, and the interview content is refined and summarized using the Colaizzi seven-stage data analysis method [8] [9].

### *2.3 Quality control*

In terms of strategies to improve the rigor, in addition to carefully selecting appropriate theoretical basis and research methods to ensure the rigor of the theory, this study also strengthens the rigor of the research process from the following aspects. (1) Establish a good relationship with the subjects: the researchers have been volunteers in the local for many times, and have established a good trust relationship with the relevant departments of the local hospital and some subjects. For the first contact subjects, they gained the trust of the subjects through in-depth face-to-face communication and the company of the subjects' friends. (2) Peer review: the members of the research group (4 undergraduate students in clinical medicine and 1 undergraduate student in preventive medicine) have regular discussions in the process of data collection and analysis to promote self-reflection of researchers and reduce research bias. (3) Refer to the COREQ List [10] to report the research design, research process, research team, analysis, results and other processes as normative and sufficient as possible to improve the quality of this research report.

## 3. Difference analysis

### *3.1 General information of the respondents*

The overall average age of 148 respondents (69 outpatients and 79 inpatients) was 40.5 years old; 47.97% ≤ 40 years old, 52.03%>40 years old; Male accounted for 56.08% and female 43.92%.

### *3.2 Knowledge of the respondents about routine urine retention*

The respondents were scored 1 point for each item they knew about routine urine retention (middle urine, morning urine, avoiding pollution, etc.). According to the comparison, the awareness of outpatient service was higher than that of inpatient service on the whole. See the Figure 1 and Figure 2 below.

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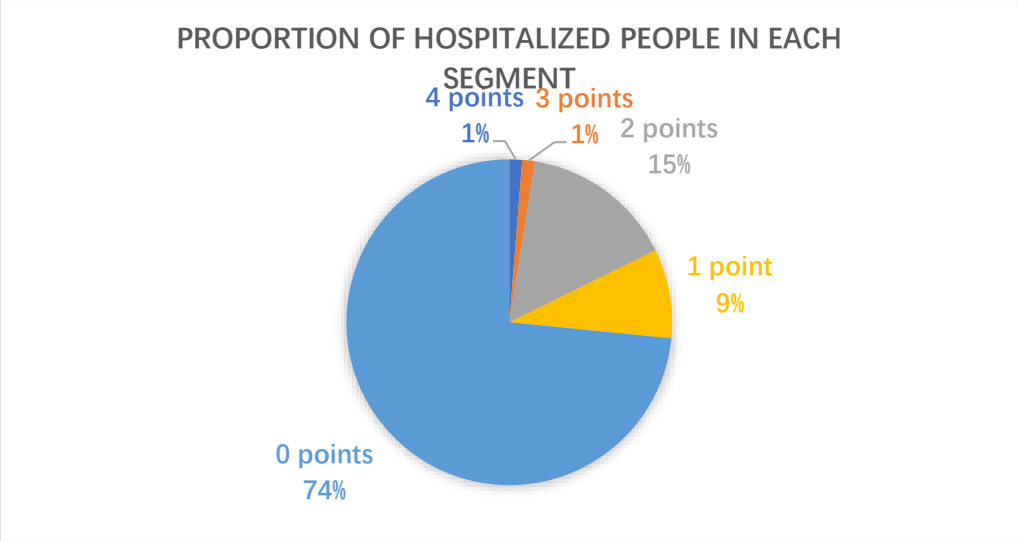


*Figure 1: Outpatient condition*

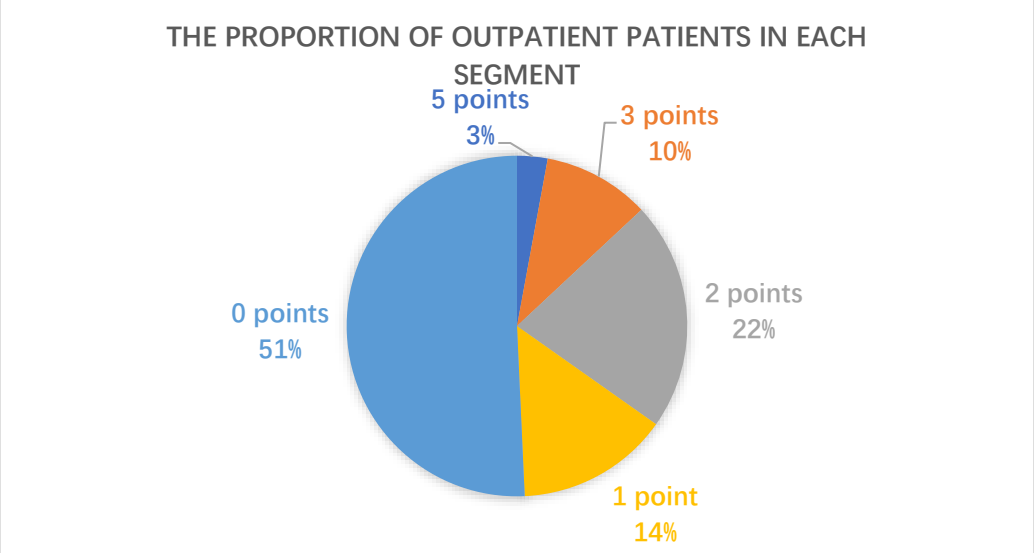


*Figure 2: Hospitalization condition*

### *3.3 Difference analysis of the awareness of routine urine between outpatient and inpatient*

SPSS26.00 software was used for statistical analysis. Chi-square test was used for univariate analysis. The score was used as the dependent variable and outpatient or inpatient was used as the independent variable to understand whether there was difference between outpatient and inpatient. The result analysis $P<0.05$ showed that there was significant difference between outpatient and inpatient in their knowledge of urinary routine.

## 4. Results

According to the statistical analysis of the difference between 148 inpatients and outpatients, the degree of knowledge of outpatients is better than that of inpatients, among which high educational level, young patients, and more urine retention times are positive behavioral factors. After repeated comparison and summary of the interview data of 20 outpatients and 19 inpatients, four themes and nine sub-themes of the current situation and experience of the grass-roots people on the retention of mid-stage urine were finally summarized.

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### *4.1 Topic 1: Barriers to information access*

#### *4.1.1 Low level of knowledge popularization*

According to the survey results of major platforms and offline visits, most of the publicity platforms and hospitals did not pay attention to the publicity of knowledge related to urine collection. 95% of the respondents did not obtain the relevant knowledge about urine sample collection from the publicity platform or the hospital before the first urine retention. A6 and B12: "The doctor did not say, nor did he brush the Tiktok, so they did not know what to pay attention to." A3 and B9: "The doctor said a little, but did not remember."

#### *4.1.2 Understanding information one-sided*

The degree of education will affect the respondents' understanding of the retention of middle urine. The interviewees with higher education level can understand and take the middle urine correctly according to the guidance of doctors and nurses. A6 and A20: "It was not known before, but now it is known through the textbook and the teacher's explanation." On the contrary, the respondents who are limited by their education level have certain one-sidedness on the retention and collection of middle urine, which makes them have wrong cognition on the collection of urine samples. A17 and B2: "I only go to primary school and have no education. Besides, it is not difficult to take a urine. Just take it directly."

#### *4.1.3 Lack of initiative*

Most of the respondents lack the motivation to actively obtain urine sample collection information or relevant knowledge. B6: "I don't want to know. Anyway, doctors and nurses will say that it's useless for us to know." And they don't care about the specific test items and test results of urine samples. A14 and A15: "I don't understand. Just do the examination and test the ingredients." A11 and B14: "I haven't actively understood the examination results. If there is any abnormality, the doctor will say it."

### *4.2 Topic 2: Negative factors of middle urinary retention*

#### *4.2.1 Poor knowledge of middle urinary retention*

After the medical staff guided the specific precautions, some respondents still said that they could not grasp the relevant knowledge well, which affected the sample quality. The study found that the low level of knowledge of retention and extraction of middle urine may be related to the professional words used by medical staff, the less times of retention of urine by patients, and the single access to information. A12 and B9 said: "I heard that doctors and nurses said to take the middle section of urine, but I don't understand it." A1 and A18 said: "I don't know this knowledge. It's all taught by doctors and nurses, but maybe because the number of times is not too many, I still don't know how to keep it."

#### *4.2.2 Lack of self-judgment*

Most of the interviewees lacked the correct judgment of the knowledge of the urine sample collection steps that doctors and nurses said. A10 and B1: "I should be right. I don't know the details. What's the best way to judge?" And I can't judge whether my urine sample collection steps are correct or not. A12 and B6: "Not very clear. The layman does not know the specification."

#### *4.2.3 Lack of attention to negative impacts*

Some respondents did not pay enough attention to the negative impact caused by the correctness of the urine sample collection procedure and did not have a clear understanding of the consequences. A10 and B4: "I haven't considered it; I don't understand it." But there are still a few respondents who have considered its negative impact. A3 and A8: "Incorrect results may affect the inspection results."

### *4.3 Topic 3: Significant differences in doctor-patient cooperation behavior*

#### *4.3.1 Positive cooperation behavior*

Some interviewees can actively cooperate with doctors and nurses and take samples according to the steps they guide. For example, A7, A8, A10 and B7 all mentioned that "according to the doctor's advice: urinate in the morning and leave the middle urine after cleaning." At the same time, with the increase of the respondents' active cooperation and collection times, their knowledge of urine collection has improved. B9: "For the first time, I only knew to take the middle urine for examination. After many examinations, I learned that I should wash it first and then take the middle urine. These precautions are

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almost known."

#### *4.3.2 Negative cooperative behavior*

Some of the interviewees were still unable to complete the urine sample collection after the doctors and nurses explained patiently. A10 and B1: "I know to clean first, and I also know that the front section is thick, and it is unsanitary to keep the middle section, but it is too troublesome, so I caught it directly".

### *4.4 Topic 4: Poor medical experience*

#### *4.4.1 Poor doctor-patient communication*

There is a lack of effective communication between the interviewees and doctors and nurses, and the medical staff may be too busy to meet the interviewees' medical demands. A9 and A16 mentioned: "The medical staff did not tell the precautions, and sometimes their attitude was not good." B15 and B16: "Even the examination results were not said."

#### *4.4.2 Urine sample collection device is unreasonable*

Most of the sampling instruments provided by hospitals are only equipped with disposable urine collection cups, which are made of plastic and have no handle. It brings great inconvenience to patients in the process of collecting urine samples. A16, B6, B7 and B8 all mentioned: "For girls, the instrument is too soft, and urine is easy to spill outside. It is better to improve it. The volume should be larger and the outside should be harder." A14, A17 and B11: "The cup has no handle, it is not very sanitary, and it is better to match a glove." B2: "It is better to match a hand sanitizer."

## 5. Discussion

### *5.1 There are significant differences between outpatient and inpatient patients in their cognitive understanding and mastery of middle urinary retention*

The analysis of this study shows that outpatient patients have a higher degree of cognitive understanding and mastery of the precautions for retention of middle urine than inpatients. The key factors of the difference are related to age, sex, education level and the number of urine retention. Randomly sampled interviewees were mostly young, with high educational background and women in the outpatient department, while the elderly were mainly hospitalized with low educational background, which fully reflected the differences between the two groups. According to the analysis of demographic data [11] [12], it can be seen that young, highly educated, female patients pay more attention to the precautions and correctness of middle urinary retention, while older, less educated, male, less frequent urinary retention, less active attention.

### *5.2 Psychology and experience of patients with clinical mid-stage urine retention*

The interview results showed that patients were not satisfied with the current urine retention system, and patients generally had difficulties in the process of specimen retention. The reasons were related to the fact that the popularization of knowledge and science was not implemented and the hospital facilities and instruments were not perfect. In the interview, the patient's psychology can be divided into two parts: one is the positive psychology (initiative, confidence, trust, learning) about the correctness of urine sample retention, and the other is the negative psychology (passive, confused, embarrassed, helpless, nervous, and ignored) about the correctness of urine sample retention. Positive psychology can encourage patients to learn independently, improve the mutual aid between doctors and patients, and increase the correct rate of middle urine retention. Negative psychology will reduce the effect of doctors' science popularization and affect the quality of urine samples.

### *5.3 Implementation suggestions for reducing the negative impact of incorrect urine sample retention*

#### *5.3.1 Carry out targeted science popularization education based on the basic characteristics of patients*

In clinical practice, patients are often involved in the six processes of standardized education, cleaning, retention, storage, submission for examination, and quality control by standardizing the urine sample retention process [13]. However, there are significant differences among different groups, so health education for different groups should be targeted. Professionals should use easy-to-understand language

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in combination with vivid demonstration actions (such as teapot dripping), make propaganda videos, interesting leaflets and manuals, regularly and fixedly arrange repeated propaganda and explanation in the community under medical care, and focus on improving the understanding and cognition of this group. Patients with mobility difficulties should focus on training their families or providing support workers to prevent them from increasing the pollution rate due to their inability to operate independently.

#### *5.3.2 Provide effective information and ensure sufficient power*

When talking about the suggestions for the current urine retention system in the interview, it was found that most of the patients had the needs for correct popular science publicity, doctors' humanistic care, complete infrastructure, and improved instruments. It is suggested that medical staff should fully realize the importance of information, pay attention to the popularization and strengthening of relevant information during the collection of urine samples from patients, pay attention to and meet the physical and mental needs of patients, help patients establish initiative awareness, provide reference for the correction of wrong behaviors of research subjects and ensure their sufficient motivation.

#### *5.3.3 Give full play to 5G mobile communication resources and innovate the common mode between doctors and patients*

The interview results showed that patients were unable to grasp the progress of knowledge learning, monitor the content and track the effect, and were often in a passive state when receiving information. Lack of interaction and communication with medical staff, delayed understanding of the correct way to take urine samples, and difficult to actively and effectively extract and apply knowledge. Research has found that with the support of modern information technology, patients will achieve effective changes between knowledge and behavior [14]. The effective use of 5G resources, the innovation of the common model between doctors and patients, and the effective integration of 5G technology and the construction of medical informatization can promote the implementation of China's grand health concept and promote the comprehensive popularization of the health China strategy [15]. The combination of modern technology and medical resources will be the key direction of future medical and health development [16].

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