

CHEPTER III

RESEARCH METHODOLOGY

RESEARCH DESIGN

This research was a cross-sectional descriptive study, to study prevalence rate and factors affecting nosocomial urinary tract infection of the patients with indwelling urinary catheter, in Thungsong Hospital, Nakhon Si Thammarat Province.

POPULATION

Target population were composed of:

1. The patients with indwelling urinary catheters in Thungsong Hospital, Nakhon Si Thammarat Province; and
2. The nurses who performed urinary catheterization and provided nursing care for the patients with indwelling urinary catheters in Thungsong Hospital, Nakhon Si Thammarat Province.

Studied population were 300 patients with indwelling urinary catheters in the In-patient Department of Thungsong Hospital, during April-June, 2003.

Sampled population were the patients with indwelling Foley's catheters who were admitted at the In-patient Department, Thungsong Hospital, during April-June 2003.

The following indwelling criteria were used for selecting the sample:-

1. Those patients who did not have any urinary infection before admission, the diagnosis of infection followed the standard diagnosis developed by the United State Center for Disease Control, 1988.
2. Those patients who have to have indwelling urinary catheters accordingly with the medical regimen.

Exclusive criteria were set as follows:

1. The first bacterial culture of the urine examination showed the member of bacteria equals or higher than 10^4 colonies/ml or fungi was found in the urine.
2. Those patients who did not have the urine samples.

SAMPLES

This research was cross-sectional descriptive study with the aim to assess the prevalence rate and factors relating nosocomial urinary tract infection of the patients with indwelling urinary catheters.

The samples of this study were composed of:

- the patients with indwelling urinary catheters; and
- the nurses who work in Thungsong Hospital and who were responsible for urinary catheterization.

THE SAMPLE SIZE

$$n = \frac{z^2 pq}{d^2}$$

n = the number of samples

z = the standard deviation at 1.96 level which equals to the level of confidence of 95 %

p = prevalence rate (24.0%)

q = 1- p

d = degree of accepted error = .05

$$n = \frac{(1.96)^2 (0.24) (0.76)}{(0.05)^2}$$

$$n = 280$$

(Note: Prevalence rate of nosocomial urinary tract infection of Thungsong Hospital in the year 2002 was 23.9%)

$$\text{Prevalence rate} = \frac{\text{Number of UTI}}{\text{Number of Catheterized patients}} \times 100$$

VARIABLES

Independent Variables:

- Patients' personal characteristics; age sex, underlying of disease
- Factors relating medical treatment: the use of antibiotic, experience of having urinary catheters inserted in the urethra, indications of getting urinary catheterization, duration of indwelling urinary catheters, the permanent use of urinary catheterization, the change of urine bag, and the size of catheters used.

- Factors relating nursing activities regarding urinary catheterization, and nursing care provided for the patients with indwelling urinary catheters.
- The processes of disinfection and sterilization used for urinary catheterization set and the flush set of the Central Supply Unit, Thungsong Hospital.

Dependent Variable

Nosocomial urinary tract infection of the patients with indwelling urinary catheters. (The result of urine culture and physician diagnosis indicated the urinary tract infection).

RESEARCH INSTRUMENTS

The research instruments used was the questionnaire developed by the researcher through the study of literature and researches concerning factors relating urinary tract infection of the patients with indwelling urinary catheters. The questionnaire was composed of 4 parts as follows:

Part 1: Patients' Personal Characteristics. This part was composed of:

- 1.1 Data from the patient's card, there were 7 questions regarding name, sex, age, marital status, medical diagnosis, admission date, and antibiotics prescribed.
- 1.2 Data from interviewing the patients or patients' relative (in case that the patients could not answer the questions by themselves, for example, being unconscious, being with respiratory tube, etc.) There were 2 questions regarding underlying disease or illness history,

medical treatment by inserting instruments in the urinary system, and signs & symptoms of urinary tract infection.

- 1.3 Data regarding the indwelling urinary catheters. There were 9 questions regarding indications of urinary catheterization, the date of starting insertion of the urinary catheters, the date of taking the urinary catheters off, duration of indwelling urinary catheters, the personnel who operated the urinary catheterization, the department that have the patients who got urinary catheterization, bladder irrigation, urine measurement per day, types of urine bag used, the change of urine bag during having indwelling urinary catheters, and the size of urinary catheters used.
- 1.4 The results of the urine examination and urine culture.
- 1.5 The diagnostic conclusion of urinary tract infection made by the physicians.

Part 2: Self-Evaluation Form for Nurses in Every Department who Operated Urinary Catheterization and Provided Nursing Care for the Patients with Indwelling Urinary Catheters. This part was composed of :

- 2.1 Personal data of the responsible nurses
- 2.2 Seventeen steps of aseptic technique in using indwelling urinary catheters

2.3 Eight of nursing care practices for the patients with indwelling urinary catheters. One – 3 rating scales were used and the scoring system was as follows:

Practice	Score
No	0
Sometime	1
Practice regularly	2

Part 3: Nurses' Activities Observation Record Form Regarding Urinary Catheterization and Nursing Care Provided for the Patients with Indwelling Urinary Catheters, (To be filled up by the researcher/ head nurses/ and the nurses who were responsible for infection control of the wards.)

- 3.1 Observation of the urinary catheterization, based on 17 steps of aseptic techniques.
- 3.2 Observation of the nursing care provided for the patients with indwelling urinary catheters. It was composed of 8 questions. One – 2 scales were used in the questionnaire, correct and incorrect practices. The score of the 1 was assigned for the correct practice and 0 (zero) was assigned for the incorrect practice.



Part 4: Observation Record Form of Disinfections and Sterilization Procedures of the Urinary Catheterization, Flush Set and Cleaning Set at the Central Supply Unit. One – 2 scales were used where by 1 was assigned for the correct practice and 0 (zero) was assigned for the incorrect practice.

CONTENT VALIDITY OF THE INSTRUMENT

The content validity of the Self-Evaluation Form of Nurses which were: personal data, data regarding the indwelling urinary catheters, and the diagnostic conclusion of urinary tract infection, was tested by the review of the following experts:

1 physician specialist in nosocomial infection control from Songkhla nakarintara Hospital

1 physician specialist in urinary system from Maharacha Nakhon Si Thammarat Hospital

1 physician expert in nosocomial infection control from Maharacha Nakhon Si Thammarat Hospital

1 physician expert in nosocomial infection control from Thungsong Hospital

Revision was made before using it with the samples by the researcher after the review and recommendations were made by the experts.

RELIABILITY OF THE INSTRUMENT

After the instrument was revised, based on the recommendations of the thesis committee members and the experts, the try-out of the instrument was made with 30 personnel who were responsible for operating urinary catheterization in Thungsong Hospital. The data were then tested for reliability by computing Cronbach's Coefficient of Alpha (α), and using the following formula:

$$\alpha = \frac{n}{n-1} \left(1 - \frac{\sum Si^2}{St^2} \right)$$

where α = reliability of the questionnaire

n = total number of the questions

Si = Variance of score of each question

St = Variance of the total score

Interpretation of the α value: the more value is close to 1, the more reliability of the questionnaire will be. The results were presented as follows:

Part 2: Self-Evaluation Form for Nurses Regarding Urinary Catheterization and Nursing Care Provided, the total number of the questions was 25 and α was 0.8254.

Part 3: Nurses' Activities Observation Record Form Regarding Urinary Catheterization and Nursing Care Provided, α was 0.7527.

DATA COLLECTION

The data were collected by the researcher through the following steps:

1. Submitting the official letter to the Director of Thungsong Hospital to present the rationale and to get the permission to collect data from the patients with indwelling urinary catheters in the In- patient Department, Thungsong Hospital from April-June,2003.
2. After the permission was made by the director of Thungsong Hospital the researcher met with the head of the Nursing Department, head nurses of all wards and the head of Nosocomial Infection Control Unit and the head of the laboratory Unit of the Hospital, to clarify the research objectives and to get the cooperation.
3. The data were collected by the researcher through:
 - 3.1 Getting the urine samples 2 times from all patients with indwelling urinary catheters:-

The 1st urine sample for urine exam was done when firstly inserted the urinary catheters in order to confirm no infection / or got infection before hospitalization.

The 2nd urine sample for urine culture was made on the 7th day of retention of the urinary catheters or on the day that take the urinary catheters out if the duration for having the indwelling urinary catheters was less than 7 days. The collection of urine samples was made by following the nursing standard for the patients with indwelling urinary catheters as follows:

1. Cleaning the end part of the catheter that connected to the urine bag with povidine solution.

2. Inject the needle number 25 with 3ml syringe at the cleaned part of catheter and take about 2-3ml. Of urine out.
 3. Pouring the urine into the sterile container.
 4. Having the urine sample be cultured by the Microbiology Laboratory Unit (Nareekul Surapattana, 1987: 50-63).
- 3.2 Recording the detailed information about the patients including information about having indwelling urinary catheters of the patients from the Record Form which was developed by modifying from the record form of nosocomial urinary tract infection of Surveillance Record Form for Nosocomial Infection of Thungsong Hospital and the Urinary Catheterization Skills Checklist (Praboromrajchanok Institute for Health Manpower Development, 1993).
- 3.3 Follow-up the results of the laboratory test regarding:
- 3.3.1 Bacterial culture and white blood cells in the non-centrifuged urine.
 - 3.3.2 Collecting the results of urine culture from all of the reports of the laboratory tests from the patients' file and submit the report to the physician for diagnosis the urinary tract infection.
- 3.4 The conclusion about the urinary tract infection was made for each patient.
- 3.5 All the data collected were checked for completion and quality before statistical analysis will be employed.

DATA ANALYSIS

The data were analyzed by using different statistical methods, as follows:

1. The general characteristics of the samples were analyzed by computing number, percentage, arithmetic means and standard deviation.
2. The relationship of the factors regarding sex, underlying disease, the nurse who operated urinary catheterization, continuous bladder irrigation, antibiotic treatment, experience of having urinary catheters inserted in the urethra, indications of getting urinary catheterization, time duration of having indwelling urinary catheters, the change of urine bag, and the size of the catheter used and the nosocomial urinary tract infection was tested by computing Chi-square test.

ETHICAL CONSIDERATION

Though this study was a descriptive research where by no intervention / experimentation was made with the subjects, the patients were informed about the nature of the study, and more importantly what had been expected from this study. They had the right to decline from participating in this study. Confidentiality of the data was reassured by the interviewers so the patients would have the confidence that their personal information would not be exposed to the public.

THE CRITERIA FOR EVALUATING NURSING CARE ACTIVITIES

The following criteria were used to evaluate the nursing care activities in urinary catheterization and the nursing care of the patients with indwelling urinary catheters (best, 1989):

Level of Nursing Care	Percent
Good	80 – 100
Moderate	60 – 79
Need to be improved	< 60