

CHAPTER THREE

METHODOLOGY

This chapter describes the procedures of the study including (1) the subjects, (2) the materials, (3) the collection of data, and (4) data analysis.

3.1 SUBJECTS

The subject in this study was the drinking water provided for school students in ten Matthayomsuksa schools, both governmental and private schools, that located in Bangkok, Nonthaburi and Patumthani provinces. The targeted schools were obtained by quota and accidental sampling methods. A list of the schools is shown in Table 1.

Table 1. List of Schools in Which Drinking Water Samples Were Collected for Testing

School number	Name of school	Number of students	School size*	School location	
				District (Amphur)	Province
	<u>Governmental schools</u>				
1	Wat Saima Community (ชุมชนวัดไทรมา)	742	small	Muang	Nonthaburi
2	Bodindecha (Sing Singhaseni) (บดินทรเดชา (สิงห์ สิงหเสนี))	900	small	Bangkrue	Nonthaburi
3	Sainoi (ไทรน้อย)	1,300	small	Sai Noi	Nonthaburi
4	Potinitwittayakom (โพธิ์นิมิตรวิทยาคม)	1,230	small	Pak-Kred	Nonthaburi
5	Kanaratbamrungpathumthani (คณะราษฎร์บำรุงปทุมธานี)	2,238	large	Muang	Pathumthani
6	Chaiyasitthawas (ชัยสิทธิवास)	421	small	Sam-Koke	Pathumthani
7	Thanyaburi (ธัญบุรี)	2,976	large	Thanyaburi	Pathumthani
	<u>Private schools</u>				
8	Rajinibon (ราชินีบน)	3,089	large	Dusit	Bangkok
9	Saint John's (เซนต์จอห์น)	900	small	Jatujak	Bangkok
10	Srisangwal (ศรีสังวาลย์)	289	small	Pak-Kred	Nonthaburi

* A school of less than 1,500 students is considered as a 'small' school. A school of more than 1,500 students is considered as a 'large' school.

Of the ten schools, five schools are located in Nonthaburi, three schools are in Patumthani and the other two are in Bangkok. During the pretest, a total of 61 samples of drinking water were collected from the targeted schools for bacteriological testing. After the intervention of providing knowledge of sanitary conditions to the school administrators, 65 samples were collected for testing as well as the pretest.

3.2 MATERIALS

The research instruments in this study were the materials for collecting drinking water samples, a checklist for inspecting appearance and sanitary conditions of water supplies, the equipment, laboratory materials, culture media and chemicals for sample analysis, the publications and a compact disc for providing knowledge of sanitary conditions, and a simple test kit for self-examination of Coliforms. These supplies are described as follows:

3.2.1 Materials for Collecting Water Samples

The drinking water samples were collected in 500 ml sterile plastic bottles using aseptic technique and were kept in the icebox containing ice packs during transportation to the laboratory.

3.2.2 Checklist

A checklist was used for the inspection of the appearance and sanitary conditions of water supplies (see Appendix A).

3.2.3 Equipment and Materials for Sample Analysis

The equipment and materials used for examining bacterial contamination in the water samples were autoclave, hot air oven 170 °C, aerobic and anaerobic incubators 35 °C, pH meter, balance with 500 gram load, bunsen lamp, water bath 44.5 °C, membrane filter apparatus, nitrocellulose membrane filter; 47 mm diameter with pore size 0.45 micron, microscope, hot plate, wire loop and needle, glassware and plasticwear.

3.2.4 Culture Media and Chemicals

The culture media used for analysis are described in the analytical

methods as part of the procedure below. The chemicals used were 70% ethyl alcohol and reagents for confirmatory tests for bacterial identification and for media preparation.

3.2.5 Materials for Providing Knowledge of Sanitary Conditions.

The materials for providing knowledge of sanitary conditions that were given to the school administrators included a manual for quality control of drinking water (ลดพาหุวรรณ แสงคล้าย และ คณะ, 2550), a booklet, a brochure and a poster about good sanitation practices for the water supply and microbial contamination and a compact disc (CD) of selection and maintenance of clean water (สำนักงานคณะกรรมการอาหารและยา 2545).

3.2.6 Simple Test Kit

A simple test kit developed by the Department of Medical Sciences (กรมวิทยาศาสตร์การแพทย์, 2548) was given to school staff for self-examination of the contamination of Coliforms in drinking water.

3.3 PROCEDURES

3.3.1 Research Design

The procedure of this study consisted of three stages, based on a one-group pretest-posttest design.

3.3.2 Data Collection

The data of this study were obtained from the microbiological analysis of drinking water samples taken from ten targeted schools. Data collection was comprised three stages as follows:

- Stage I Pretest (before intervention)
- Stage II Intervention
- Stage III Posttest (after intervention)

These three stages are described below.