# CHAPTER III

# RESEARCH METHODOLOGY

## 3.1 Research design

This was a cross - sectional study which was conducted in tertiary and secondary health care settings of Maldives from 18th February to 20th March 2008. A pilot study was conducted in Hithadhoo Regional Hospital in order to test the reliability of the questionnaire.

## 3.2 Study population

Study population included two tertiary (public and private) and one secondary health care facility. Target areas were identified by multi-stage cluster sampling. Health care facilities were divided into clusters, according to characteristics of level of services, and type of organization (tertiary and secondary level of health care). The two tertiary care hospitals exist in the country were included, as administration and management was different from each other. They are IGMH and ADK hospital. The functions of six regional hospitals situated across the nations were similar.

Therefore one among six regional hospitals (Thinadhoo Regional Hospital) was selected by random for representation of secondary health care facilities. Target populations were doctors and nurses who provide direct care to patients. Doctors and nurses working in the department(s) of administration, laboratory, dental and

radiology were excluded from all the three hospitals. Doctors and nurses who were on leave have been excluded from the sample frame as well.

## 3.3 Sampling method

Sampling technique: Stratified sampling technique was used to select the samples from selected areas.

### 3.3.1 Sample size

Yamane's formula was used to calculate the sample size. In accordance to Isreal (2006), this is a simplified formula which can be used to calculate proportions. This formula has been used for known finite population in several studies (cited in reference Chottanapund, 2002)

$$n = \frac{N}{1 + N (e)^2}$$

n - The sample size

N - The population size

$e$- The desired level of precision

$e$- Level of acceptable error = 0.05)

Total sample (n) = 632 /1(632 x 0.05 x0.05)

= 245 persons

In order to avoid problems of non response bias additional 10% was included to the sample size. Therefore, the total sample size calculated to include in the study was 270 persons.

Sample size was selected according to the proportion 270/660 from IGMH, which has the highest population compare to the ADK Hospital and Thinadhoo R. Hospital. As the proportions required for these two hospitals were much smaller, whole census of these two hospitals was included. According to Israel (2006) sampling errors would be eliminated by using census for small population.

Table 3.1: Sample size selected from each hospital

| Institution | Staff | Total Numbers | Total Numbers excluding leave | Proportions required (%) | Sample size required |
|---|---|---|---|---|---|
| IGMH | Doctors | 165 | 150 | 0.23 | 61* |
| | Staff Nurses | 408 | 389 | 0.58 | 159* |
| ADK Hospital | Doctors | 27 | 20 | 0.04 | 20 |
| | Staff Nurses | 50 | 46 | 0.07 | 46 |
| Thinadhoo R. Hospital | Doctors | 15 | 12 | 0.02 | 12 |
| | Staff Nurses | 34 | 32 | 0.05 | 32 |
| Total | | 699 | 660 | | 330 |

* Sample size calculated according to the proportions

## 3.4 Data collection

The purpose of the survey and procedure of data collection was explained to the concerned authorities of all hospitals. A working schedule was prepared after the discussion including dates and timings for observation, distribution and collecting questionnaires in each hospital.

Observation of various departments of the hospitals was done prior to 2-3 days of distributing questionnaires. Questionnaires were distributed to the participants' randomly 1-2 departments per shift. Some participants completed the questionnaire immediately. Some of them returned the next day, yet most of the staff returned sometime during the shift except in ADK hospital. The management of this hospital allocated a coordinator to distribute and collect questionnaires from all participants. This arrangement was done for the convenience of staff on duty. However the same method was followed for distribution of questionnaires.

## 3.5 Research instruments

Research instruments were developed by referring guidelines for *Isolation precautions: Preventing transmission of infectious agents in health care setting* 2007 developed by developed in reference to Siegel et al. (2007). The questions were designed to cover different aspects of standard and transmission based-precautions.

Standard precautions consists of hand hygiene, use of personal protective equipment (PPE), patient placement, patient care equipments and instrument devices, care of environment, textile and laundry, and safe injection practices. Except safe injection practices the rest of the elements of the standard precautions in 2007 were

not included in the questionnaire. These elements were *respiratory hygiene, cough etiquette, and use of mask for procedures required during lumber puncture.* The reason for this exclusion was that these hospitals have not yet adopted the most recent guidelines. Transmission-based precaution is comprised of airborne precaution, droplet precaution, contact precaution and standard precaution.

### 3.5.1 The questionnaire consists of 5 parts

3.5.1.1 Part 1 Socio-demographic data

The socio-demographic information included were place of work, age, sex, marital status, information on education and work experience. Information regarding training on infection control practices too was integrated.

3.5.1.2 Part 2 Knowledge regarding standard and transmission-based precautions

There were 15 questions in this part. Inquiries regarding various components of standard and transmission-based precautions were included. A correct answer was given score 1 and 0 for an incorrect or wrong answer. Scores varied from 0 – 15 points. Scores were given in percentages according Bloom's cut off point (cited in referance Limros, 2005). High knowledge level group had more than 80% correct answers. Moderate knowledge level had 60-79 correct answers. And less than 59% was considered for low level knowledge group.

The three levels were:

| | | |
|---|---|---|
| High level | (80 – 100%) | 13 - 15 scores |
| Moderate level | (60 – 79%) | 10 - 12 scores |
| Low level | (< 59%) | 0 - 9 scores |

### 3.5.1.3 Part 3 Attitude towards standard and transmission-based precautions

These questions were based on attitude of doctors and nurses towards standard and transmission-based precautions. There were 15 statements both positive and negative. Likert's scale was used for assessment. Scores for positive statements (questions no. 1, 5, 7, 8, 12, 13, 14) were given from 5-1 (5- strongly agree, 4-Agree, 3- Neither agree nor disagree, 2- Disagree, 1-strongly disagree). And for negative statements (questions no. 2, 3, 4, 6, 9, 10, 11, 15) scores were given from 1-5 from strongly agree to strongly disagree. Negative statements were reversed for the purpose of analysis. All individual answers were summed up to obtain mean scores, dividing all participants into three groups (positive attitude, neutral attitude, and negative attitude).

### 3.5.1.4 Part 4 Practice of standard and transmission based precautions

A total of 15 questions regarding the practice of standard precaution and transmission- based precaution were included. Participants were asked to rate from 1 to 5 (1-never, 2-seldom, 3-sometimes, 4-often, and 5-very often. Mean scores were used to classify the observed frequencies (high, moderate and low group).

3.5.1.5 Part 5 Observation of standard and transmission based practice

Observation was done prior to 2-3 days of survey in each health care facility. Observation of various elements of standard and transmission-based precautions practice was carried out in each institution. The main observations included were performance of hand hygiene, use of PPE, sharp disposal, linen handling and method of waste disposal. Performance was measured approximately as it was not possible to measure quantitatively in such a working environment. The initial plan was to measure them quantitatively. However the activities included in the guidelines were observed and pattern of practice was recorded in each shift.

## 3.6 Reliability and Validity

Questionnaires were prepared by referring *'Guidelines for isolation Precautions: Preventing transmission of infectious Agents in Healthcare settings 2007'*. Expert opinions for content validity were obtained from the 2 leading members of infection control team of IGMH. The results of the questionnaire were used to check the internal consistency. The results of Cronbach's Alpha Coefficient score for knowledge part was 0.46, attitude part 0.94, and for the practice part 0.93. Knowledge part for the questionnaire was revised due to low internal consistency. Alterations were made focusing on the comments received during the pilot study as well as expert opinions. However questionnaire was not re-evaluated due to time constraint.

## 3.7 Ethical consideration and Confidentiality

The Health Research Committee of Maldives reviewed the research proposal for ethical consideration and consented to conduct the survey. Permission from individual institutions was obtained through Ministry of Health (MOH). Purpose of the study was explained to the participants both verbally and in writing. A letter which described survey details were attached to the questionnaire (Refer appendix B). No questionnaire indicated name to ensure confidentiality of the participants.

## 3.8 Data Analysis

Upon completion of data collection, all items were coded and analyzed by using SPSS program. Frequency and percentages of socio-demographic data (place of work, occupation, educational status, age, sex, working area (department), marital status, years of work experience, and training on infection control practice) were obtained. Chi square test was used to find out the association between socio-demographic characteristics and standard and transmission-based precautions practices. Co-relation co-efficient was used to find out the relationship between knowledge and attitude with practice.