MICROBIOLOGICAL EXAMINATION OF AIR IN MEDICAL DEPARTMENT AND INCIDENCE OF NOSOCOMIAL INFECTION IN SELECTED SECONDARY PRIVATE HOSPITALS IN CAVITE

THESIS

ERIKA LEI D. COLADA
ALISA L. JIMENEZ

College of Nursing
CAVITE STATE UNIVERSITY
Indang, Cavite

November 2016

MICROBIOLOGICAL EXAMINATION OF AIR IN MEDICAL DEPARTMENT AND INCIDENCE OF NOSOCOMIAL INFECTION IN SELECTED SECONDARY PRIVATE HOSPITALS IN CAVITE

Undergraduate Thesis
Submitted to the Faculty of the
Department of Medical Technology
College of Nursing
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree
Bachelor of Science in Medical Technology

ERIKA LEI D. COLADA
ALISA L. JIMENEZ
November 2016

ABSTRACT

COLADA, ERIKA LEI D. JIMENEZ, ALISA L. MICROBIOLOGICAL EXAMINATION OF AIR IN MEDICAL DEPARTMENT AND INCIDENCE OF NOSOCOMIAL INFECTION IN SELECTED SECONDARY PRIVATE HOSPITALS IN CAVITE. Undergraduate Thesis. Bachelor of Science in Medical Technology. Cavite State University Indang, Cavite. October 2016. Adviser: Karen Krista M. Escobar, RMT, MSMT.

The collected samples for different medical department of selected secondary hospitals were processed at the microbiology laboratory of De La Salle Health Sciences Institute-Research Division Center for Basic Biomedical Research, City of Dasmariñas, Cavite. This study was conducted from July to September 2016. Generally, this study aimed to verify the microbiological examination of air in medical department and incidence of nosocomial infection in selected secondary private hospitals in Cavite. Specifically, it aimed to: (1) determine the demographic profile of each hospital in terms of: the year the hospital was established, the classification of medical department room – private or ward, the presence of air conditioning unit and the number of bed capacity; (2) determine the incidence of nosocomial infection from December 2015 to May 2016; (3) identify the isolated bacteria present in each medical ward and private room of secondary private hospitals in Cavite; (4) determine if there is a significant difference between the CFU result and the standard CFU for each hospital in each trial; and (5) determine the association between the bacteria isolated in each hospital and the incidence of nosocomial infection.

This study used descriptive design. There were two trials in each hospital, one in the medical ward and the other in a private room. Settle plate method was a passive air sampling used for testing quality of air in surgical operation theaters and hospital ward.

Based on the outcome of the study, the following conclusions were made: The morphological characteristics of *Staphylococcus aureus* exhibited small to large mucoid with creamy white, yellow and creamy white with ß-hemolysis colonies. The *Staphylococcus epidermidis* exhibited small to large creamy white and yellow colonies. *Pseudomonas aeruginosa* showed rhizoid, irregular and rough colonies with indole negative (-), methyl red negative (-), voges proskauer (-), citrate (+) and TSI K/K. The isolated organisms showed positive results in Catalase test. Isolated nosocomial pathogens were *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Pseudomonas aeruginosa*. The most frequent isolate was *Staphylococcus aureus* and *Staphylococcus epidermidis*. Based on the CFU result, there was no significant difference between the CFU result of the isolated bacteria and the standard CFU. There was no record of nosocomial infection in each hospital, therefore, the bacteria isolated in each hospital and the incidence of nosocomial infection had no association.

This study indicated that the nosocomial pathogens were frequently present in air of medical department. But the nosocomial pathogens were needed to exceed the acceptable level of index of microbial contamination in order to cause infection. In order to reduce the risk of nosocomial infections, this study recommended the following: Reorientation of the utility workers about alternative ways of cleaning procedures in medical departments specifically the proper ventilation of the rooms. The hospital should observe separating admitted infectious patients with non-infectious patients to avoid the

spread of disease to others. Patients and health care personnel should be more aware, cautious and careful of their surroundings specifically when there are possible pathogenic organisms present. It was also recommended to wear face mask; and hand washing must be implemented to avoid the spread of nosocomial infections. Further research study related to isolation of nosocomial bacterial pathogens in air of medical departments or other special areas of hospital should be conducted. The use of selective media in order to isolate different organisms and to easily identify different nosocomial pathogens present and isolation of nosocomial pathogens in air from different rooms and facilities (i.e, surgical rooms, emergency rooms, ICUs).

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIX TABLES

LIST OF APPENDIX FIGURES

LIST OF APPENDICES

MICROBIOLOGICAL EXAMINATION OF AIR IN MEDICAL DEPARTMENT AND INCIDENCE OF NOSOCOMIAL INFECTION IN SELECTED SECONDARY PRIVATE HOSPITALS IN CAVITE

Erika Lei D. Colada
Alisa L. Jimenez

An undergraduate thesis manuscript submitted to the faculty of Department of Medical Technology, College of Nursing, Cavite State University, Indang, Cavite in partial fulfilment of the requirements for the degree of Bachelor of Science in Medical Technology with Contribution No. SP CON MT-2017-17, Prepared under the supervision of Ms. Karen Krista M. Escobar, RMT, MSMT.

INTRODUCTION

Hospital-acquired infection (HAI) is an important public health issue with unacceptable levels of morbidity and mortality, over the last five years. Disease can be transmitted by air, by direct or indirect contact or both. Contact transmission of disease forms the majority of HAI cases; transmission through the air is more difficult to control (Tang *et al.*, 2006).

The hospital is a place for treatment and recovery from illnesses, but this is also a place where one can acquire diseases. Instead of recovering from illness the condition of a patient may worsen. Airborne transmission is one of the routes of spreading diseases responsible for a number of nosocomial infections (Claudete *et al.*, 2006).

The rate of this infection varies from 5 to 10 percent in the developed countries to 25 percent or more in developing countries. These infections are mostly caused by