Upgrading Knowledge and Skills of Cairo University Nursing Students in Infection Control: An Interventional Study

Thesis

Submitted for Partial Fulfillment of Master Degree in
Public Health and Community Medicine

BY

Salma Abdel-Rehim Seddik

Under Supervision of

Dr. Mona Soliman Mohamed
Professor of Public Health and Community Medicine
Faculty of Medicine, Cairo University

Dr. Dalia Ahmed Mohamed
Assistant Professor of Public Health and Community Medicine
Faculty of Medicine, Cairo University

Dr. Ghada Wahby Mohamed
Lecturer of Public Health and Community Medicine
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
2013

ABSTRACT

Capacity building of nursing students to develop appropriate knowledge and skills in infection control (IC) is crucial for health care quality. Nurses do receive IC training before graduation, however; their actual IC performance is still unfavorable. Therefore, there is a need to provide evidence -based strategies in training practices for nursing students. **Objectives**: To design and conduct training strategy based on needs detected by the baseline assessment, and evaluates its impact on knowledge and skills of nursing students. **Methodology**: An operations research - interventional study- pretest - posttest design, it was conducted at the Technical Institute of Nursing, Cairo University (TIN-CU).Fifty eight students participated in the study(pretest-training-immediate posttest) however 38 students continued to participate in the maintenance posttest. **Results**: TIN-CU IC curriculum was assessed according to the basic national guidelines for IC(10 chapters) by Ministry of Health and Population(MOHP), it was found that 7 chapters of the national guidelines were present in the institute's original curriculum though some important items were missing and 3 chapters were completely absent from the institute's original curriculum . Regarding the total knowledge and skills scores of the trainees significant improvement was achieved immediately after the training (p value<0.001), significant decline was found between immediate and maintenance posttest (p value<0.001). Regarding the total knowledge score of the trainees, their maintenance posttest level was significantly higher than pretest level (p value<0.001), however for the total skills score no significant change was found (p value=0.772). **Conclusion**: Introducing IC training to nursing students led to immediate improvement of their knowledge and skills, this improvement was sustained regarding the IC knowledge and was lost regarding the IC skills. **Recommendations:** Upgrading IC curriculum of nursing students and conducting further research about IC teaching and training by different approaches.

Key words: Capacity building, infection control, nursing students, knowledge, skills.

Acknowledgement

After utmost gratefulness to ALLAH, I would like to express my deepest thanks to ***Dr. Mona Soliman Mohamed****; Professor of Public Health and Community Medicine, Faculty of Medicine, Cairo University, for her great help and valuable guidance.*

Great thanks to ***Dr. Dalia Ahmed Mohamed;*** *Assistant Professor of Public Health and Community Medicine, Faculty of Medicine, Cairo University, for her great help and valuable guidance.*

Great thanks to ***Dr. Ghada Wahby Mohamed****; Lecturer of Public Health and Community Medicine, Faculty of Medicine, Cairo University, for her enormous help and close supervision.*

Great thanks and appreciation to ***Dr. Maha El-Rabbat****; Head of department of Public Health and Community Medicine, Faculty of Medicine, Cairo University, for her enormous help and support.*

Great thanks and appreciation to ***Dr. Maha Ghobashi****; Professor of Public Health and Community Medicine, Faculty of Medicine, Cairo University who supported this study.*

Great thanks to Dr ***Menna Said and Dr Hend Samy*** *demonstrators of public Health and Community Medicine, Faculty of Medicine, Cairo University for their valuable sincere help in organizing and*

monitoring the students during their pre-test and post-test assessments.

My deep appreciation to the whole staff of the Technical Institute of Nursing, Cairo University as well as, the students who were enthusiastic and co-operative.

List of Abbreviations

ANA	:	American Nurses Association
CABSIs	:	Central line-associated bloodstream infections
CAUTIs	:	catheter-associated urinary tract infections
CDC	:	Center for disease control and prevention
CPR	:	Cardiopulmonary resuscitation
ECMO	:	Extracorporeal membrane oxygenation
ED	:	Emergency department
EDHS	:	Egyptian Demographic and Health Survey
EPA	:	Environmental Protection Agency
HAP	:	Hospital Associated Pneumonia
HBV	:	Hepatitis B virus
HCAIs	:	Health care associated infections
HCV	:	Hepatitis C virus
HCWs	:	Health care workers
HICPAC	:	Healthcare Infection Control Practices Advisory Committee
HIV	:	Human immunodeficiency virus
HLD	:	High level disinfectant
IABP	:	Intra-aortic balloon pumps
IC	:	Infection control
ICLNs	:	Infection Control Link Nurses
ICN	:	International Council of Nurses
ICN	:	Infection control nurse
ICT	:	Infection control team
ICU	:	Intensive care unit
ILD	:	Intermediate level disinfectant
IP& C	:	Infection prevention and control
IPCP	:	Infection Prevention and Control Programs
LLD	:	Low level disinfectant
MOHP	:	Ministry of Health and Population
MRSA	:	Methicillin-resistant staphylococcus aureus
NHSN	:	National Health Safety Network
NICUs	:	Neonatal intensive care units

OJT	:	On the job training
OSHA	:	Occupational Safety and Health Administration
PHCM-FOM-CU	:	Public Health and Community Medicine department – Faculty of Medicine - Cairo University
PPE	:	Personal protective equipment
SOP	:	Standards of practice
SSIs	:	Surgical site infections
TIN-CU	:	Technical Institute of Nursing, Cairo University
U.S.	:	United States
UTI	:	Urinary tract infection
VAP	:	Ventilator-associated pneumonia
VRE	:	Vancomycin-resistant enterococci
WHO	:	World Health Organization

CONTENTS

List of Graphs

LIST OF TABLES

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

الرَّحْمَنُ (1) عَلَّمَ الْقُرْآنَ (2) خَلَقَ الْإِنْسَانَ (3) عَلَّمَهُ الْبَيَانَ (4)

صدق الله العظيم

سورة الرحمن ايه (1-4)

INTRODUCTION

Infection is considered nosocomial if it becomes evident 48 hours or more after hospital admission **(Bello et al., 2011).** Nosocomial infections extend patient's hospital stay and increase health care expenses and mortality **(Dawson, 2003).** There is evidence that prevention and control of hospital acquired infection is an important aspect of health care across the world **(Ward, 2011)** [2]**.** Education in infection control (IC) has been identified both nationally and internationally as essential strategy in any health care setting. As future practitioners in supporting IC in health care settings, capacity building of nursing students to develop appropriate skills in IC is crucial for quality in health care **(Ward, 2011)** [1]**.** This type of capacity building in IC requires specific potentials as the nurse should be keen, enthusiastic, motivated and volunteer, with a special interest in IC **(Dawson, 2003).** Additionally, improving knowledge and behavior of health care workers who could be transmittal to pathogenic agents in hospitals could reduce spread of nosocomial infections **(Bello et al., 2011)**. To improve such practices, standard precautions combine measures to prevent nosocomial infections in patients and job-related infections in health care workers (HCWs). Among which are hand hygiene, personal hygiene, safe handling of sharp objects and use of personal protective equipment (PPE) **(Duerink et al., 2006).**

Despite having international standards of practice (SOP) in IC, it was found that developing countries are 20 times more at-risk of contracting nosocomial infections than developed countries **(Bello et al., 2011).** According to the Egyptian Demographic and Heath survey (EDHS)

2008,the prevalence of health system-related infections such as hepatitis C virus (HCV) infection is high (14% among those above 15 years of age**) (El-Zanaty and Way, 2009)** and in 2001 sepsis rates in a number of neonatal intensive care units (NICUs) reached as high as 70% **(MOHP, 2003)** [6]**.** Improving adherence to standard precautions has been the aim of many interventional studies focusing on behavioral changes of HCWs **(Duerink et al., 2006).** However, those studies were mostly conducted for officially practicing - not the undergraduate – nurses. As well, the Egyptian Ministry of Health and Population (MOHP) (2003) issued the "National Guidelines for Infection Control", but there is no enough information about the integration availability of those guidelines in the nursing education curriculum or whether they are applied in nursing training and practice. Nurses do receive IC training before graduation; however, their actual IC performance is still unfavorable especially during night shifts in critical health settings as neonatal emergency care units **(Abdel-Wahab et al., 2013).** Therefore, there are needs to provide evidence -based methodology/strategies **i**n training practices for nursing students that build up in-depth understanding and behavioral changes to adopt the vital importance of IC practices in healthcare settings.

Implication of the study on the Health Care System Improvement:

Training in IC is implemented as an independent course for the first year nursing students in Technical Institute of Nursing - Cairo University (TIN-CU). The course includes both theoretical part and skill lab training. First year students TIN-CU will be graduated in 2 years. They will officially lead an independent IC practice. Therefore, providing evidence

based successful strategies in the educational process could promote performance of nursing students when they start an independent practice.

AIM OF THE STUDY

Aim:

The aim of this study is to improve nursing students' knowledge and skills in IC through improving their undergraduate training course.

Specific objectives:

1. Revise the contents of the TIN-CU IC curriculum,
2. Assess the baseline knowledge and skills in IC among nursing students,
3. Design a training strategy based on needs detected by the baseline assessment,
4. Conduct the new training strategy,
5. Evaluate the impact of the new training strategy on knowledge and skills of nursing students.
6. Suggest educational methods to be adopted by TIN-CU for upgrading nurses' performance in IC.