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Exploring the practices employed by nurses in stethoscope care

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ABSTRACT

Background

Methicillin-Resistant Staphylococcus aureus (MRSA) infection may take place due to poor hygienic practices involving stethoscope utilization and cleaning. Despite possibility of infection that may occur in stethoscopes used in hospitals, nurses have a great role in eliminating this infection through stethoscope care, meticulously and regularly provided before and after patient care.

Objective

The specific aim of the study was to explore the practices employed by nurses in different hospitals in Pampanga regarding the care of stethoscope.

Method

A validated questionnaire containing the items of the study was administered to 211 nurses in different hospitals of Pampanga. Quantitative data were group according to frequency and percentage distributions and were analyzed and interpreted using literature review.

Results

Findings revealed a minority of nurses who had their own stethoscope, where majority of which relied on hospital supply of stethoscope in their practice in the clinical area. Stethoscopes were cleaned infrequently before and after patient care using alcohol swab.

Discussion

Findings support the need for regular cleaning of stethoscope before and after patient contact using isopropyl alcohol. Though the study has not been supported by microscopic determination of MRSA in stethoscopes, frequent stethoscope care is advocated to prevent bacterial contamination of the said instrument, thereby eliminating possibility of nosocomial infection to patients and to health care providers.

Conclusion

Stethoscopes carry clinically significant pathogenic microorganisms. The study implied a starting point of developing recommendations for disinfection policy review in minimizing cross-infection that is greatly reduced by regular stethoscope disinfection.

Keywords: Stethoscope; Stethoscope care; Infection control, MRSA

INTRODUCTION

Background of the Study

Since the time of Hippocrates, physicians listened directly to patients' chests as they tried to assess cardiac health. The inventor of the stethoscope, Rene Theophile- Hyacinthe Laennec, relied on this method, too. One day, when he needed to examine an obese young woman, Laennec hesitated to put his head to her chest. Remembering that you can hear a pin scraping one end of a plank by putting your ear to the other end, he came up with the idea for a stethoscope prototype. He rolled a stack of paper into a cylinder, pressed one end to the patient's chest, and held his ear to the other end. Laennec's first manufactured stethoscope was a simple wooden tube. A succession of different designs followed his, including, eventually, a "binaural" type with two ear pieces. In 1850, George Camman substituted rubber for stiffer materials and made a more comfortable model—the forerunner of today's stethoscopes. The use of the stethoscope led to better descriptions of heart sounds and improved ability to distinguish among various murmurs and rhythmic disturbances. It increased understanding of how blood moves through the heart in each cardiac cycle, under normal and abnormal conditions. From the time it was invented in 1816 until early this century, the stethoscope was the most reliable and informative tool available for diagnosing cardiovascular disease. Although other, more sophisticated diagnostic methods have come into use since then, the stethoscope has never been discarded. "At the turn of the century...diagnosis relied on taking a history and examining the heart with a stethoscope, and treatment consisted mainly of rest and a few standard oral medications." said

W. Bruce Fye, a University of Wisconsin cardiologist and historian.

Nurses in the hospital consider stethoscope as an indispensable instrument utilized in the delivery of health care services to patients. Primarily for assessment, the stethoscope has been used in various procedures and its exposure to patients with different ailments increases the likelihood of contamination. In a study conducted in Hammersmith Hospital, London, United Kingdom by Whittington AM, Whitlow G, Hewson D, Thomas C, Brett SJ.(August 2009), it assessed how often bedside stethoscopes in the intensive care unit were cleaned and whether they became colonized with potentially pathogenic bacteria. On two separate days the 12 nurses attending the bed spaces were questioned about frequency of stethoscope cleaning on the unit and the bedside stethoscopes were swabbed before and after cleaning to identify colonizing organisms. Twenty-two health care providers entering the unit were asked the same questions and had their personal stethoscopes swabbed. All 32 non-medical staff cleaned their stethoscopes at least every day; however only three out of the 12 medical staff cleaned this often. Out of 24 intensive care unit bedside stethoscopes tested, two diaphragms and five earpieces were colonised with pathogenic bacteria. Methicillin- Resistant Staphylococcus aureus (MRSA) cultured from one earpiece persisted after cleaning. Three out of the 22 personal stethoscope diaphragms and five earpieces were colonized with pathogens. After cleaning, two diaphragms and two earpieces were still colonized, demonstrating the importance of regular cleaning. The authors of another study swabbed 50 stethoscopes, this time, of Emergency Medical Service providers presenting to their emergency department (ED) with patients. The swabs were

then cultured to detect the presence of MRSA. They found 16 (32%) colonized with MRSA. When asked, none of the 16 (32%) could recall the last time their stethoscope had been cleaned (Keith Wesley, MD, FACEP, 2009).

The findings of another study conducted by Ariel Schroeder, Maryellen A. Schroeder, MD, MPH and Frank D'Amico, PhD (2009) suggest that the use of alcohol-based hand foam to simultaneously sterilize the hands and a stethoscope head significantly reduces the number of bacterial colonies, including MRSA. The quantifiable risk of clinical infection with MRSA in patients through brief contact with a contaminated fomite such as a stethoscope is unknown. However, the transmission of the bacteria itself from contaminated surfaces and hands through brief contacts has been well established.

Methicillin- Resistant Staphylococcus aureus (MRSA)

Staphylococcus aureus is a type of bacteria commonly carried on the skin, in the nares, and on the perineum of healthy people. It may cause superficial skin infections that can ordinarily be treated with skin care and appropriate antibiotics, such as beta-lactam inhibitors. Over time, however, some strains of *S. aureus* have become resistant to beta lactam inhibitors such as methicillin, once the drug of choice for this type of infection. The first cases of MRSA infections in the United States were reported in the 1960s. Today, 46 out of 1,000 patients have MRSA. Clinicians turned to vancomycin to treat MRSA, but several new strains of MRSA are now resistant to this drug as well; they're known as vancomycin intermediate-resistant *Staphylococcus aureus* (VISA). Patients with VISA have severely limited treatment options.

Community-associated MRSA is a serious disease that tends to cause skin and soft-tissue infections, such as boils, blisters, abscesses, folliculitis, and carbuncles. These are accompanied by fever and local warmth, swelling, pain, and purulent drainage. What may look like a spider bite may actually be an early sign of a MRSA infection. According to the Centers Disease Control and Prevention definition, a diagnosis of CAMRSA requires that the patient have no medical history of MRSA or colonization and no risk factors associated with health care-associated MRSA.

Health care-associated MRSA is even more highly drug resistant than CA-MRSA and tends to cause more invasive infections, such as surgical site infection, endocarditis, osteomyelitis, bacteremia, or pneumonia. If infection develops in a wound or at a catheter or tube insertion site, redness, swelling, tenderness, or an abscess may be seen. At home and in the community, MRSA is transmitted person to person by sharing personal items such as clothing and towels and from close contact. In a health care facility, MRSA is transmitted largely from contaminated environmental surfaces or by staff members. Although colonized and infected patients are the chief reservoirs of MRSA, health care workers can also act as reservoirs, harboring the microorganism for many months. When health care workers do not follow appropriate infection control measures, their hands and clothing can easily become contaminated.

Alcohol-based hand sanitizers are a suitable substitute for hand washing when caring for patients with MRSA as long as the hands are not visibly soiled or grossly contaminated. Sinks and alcohol-based hand sanitizer dispensers must be easily accessible (Yamamoto, L. and M. Marten, 2007).

About one third of all nosocomial infections are preventable. For planning preventive actions, it is essential to identify the reservoirs of microorganisms that cause nosocomial infections. Hands of the hospital staff, medical equipment such as catheters, surgical instruments, implants, ventilators, endoscopes, thermometers, ultrasound probes and otoscopes may all serve as the reservoir for microorganisms. The stethoscope, a universal tool of medical profession is often used on multiple patients (Vergheze D, and H. Patel, 1999).

In this regard, this has driven the researchers to conduct a study concerning the practices employed by nurses in the hospitals of Pampanga in the care of the stethoscope. This may serve as a basis for control of nosocomial infection. Various aseptic methods are utilized in hospitals to reduce to a minimum or much better, to totally eliminate pathogens that cause nosocomial infections to patients and members of the health care team. The use of stethoscope is closely associated with surfacing of Methicillin-Resistant *Staphylococcus aureus* infection, when the said instrument is not properly taken care of.

Research Questions

The study, therefore, is geared towards the determination of the practices employed by the nurses in different hospitals in Pampanga regarding care of the stethoscope, an instrument that is indispensable to their practice in rendering quality nursing care. It underpinned the problem specifically by answering the following:

How may the respondents be described in terms of

Profile

- Position
- Length of practice
- Clinical area of practice

Ownership and source of stethoscope use

Stethoscope use and care: owned

- Type of stethoscope
- Duration of use of stethoscope
- Frequency of stethoscope care

Knowledge on stethoscope parts

Utilization of stethoscope; and

- Procedures involving stethoscope care use
- Body part in contact with stethoscope use

Stethoscope care before and after use?

METHODS

Research Design

A descriptive quantitative research was applied in the study to describe the nursing phenomena. The study sought to describe the practices employed by nurses in different hospitals regarding the care of the stethoscope.

Setting and Samples

The study includes 5 secondary hospitals in Pampanga Province, Philippines as research

settings/locales of the study. The inclusion criteria were established to determine respondent who are eligible to participate in the study. Such criteria include the following: a) nurses must be currently working as a bedside nurse; b) nurses must be using stethoscope in their area of practice; c) Nurses presently practicing in selected hospitals in Pampanga. A total of two hundred eleven (211) staff nurses were selected as respondents of the study.

Research Instrument

A self-administered questionnaire (SAQ) was utilized to explore in detail the practices of the nurses regarding stethoscope care. Content and construct validation was accomplished by five (5) experts in the nursing profession to ensure validity of the questionnaire. Pilot testing was conducted to 30 staff nurse respondents.

Data Collection Procedure

The initial step performed in the data collection process is accomplished by seeking permission from the Medical Director of the hospital thru the Chief Nurse. After the approval or permission from the Chief Nurse, the self-administered questionnaire was provided to the staff nurse respondents who were willing to participate in the study. Signing of the informed consent by the selected respondents was also ensured prior data collection. The period of data gathering lasted from October 2017 to March 2018.

Data Analysis

Frequency and percentage distribution were used in grouping and analyzing quantitative/descriptive data. The data obtained in the study were organized using frequency and percentage distribution which included the respondent's profile, stethoscope utilization and care.

RESULTS AND DISCUSSION

Table 1: Nurse Respondents' Profile

Respondents' Profile	Frequency	Percentage (%)
A. Position		
Staff	97	46.0
Volunteer	77	36.5
Trainee	35	16.6
Supervisor	2	0.9

TOTAL	211	100.0%
B. Length of Practice		
<i>Less than 1 year</i>	124	58.8
<i>1-3 years</i>	60	28.4
<i>4-6 years</i>	20	9.5
<i>7-9 years</i>	2	0.9
<i>More than 9 years</i>	5	2.4
TOTAL	211	100.0%
C. Clinical Area of Practice*		
<i>Medical-Surgical Ward</i>	130	26.5
<i>Obstetrical Ward</i>	77	15.7
<i>Pediatric Ward</i>	75	15.3
<i>Emergency Room</i>	59	12.0
<i>Operating Room</i>	40	8.2
<i>Delivery Room</i>	39	7.9
<i>Intensive Care Unit</i>	35	7.1
<i>Hemodialysis</i>	22	4.5
<i>Out Patient Department</i>	14	2.8
TOTAL	491	100.0 %

**Based on Multiple Responses

Table 1 shows the nurse respondent's profile which includes the position, length of practice and clinical area of practice. Most of the respondents are staff nurses (n= 97; 46.0%). On the other hand, some are nurse volunteers (n=77; 36.5%), others are trainees, (n=35; 16.6%), and very few are charge nurse (n=2; 0.9%). This implied that due to an increasing number of registered nurses produced every year. The increased number of staff members are expected to act and have good practicing in the area concerning infection control measures like proper care of the stethoscope.

Majority of the respondents have less than 1 year of hospital experience (n=124; 58.8%) followed by those respondents with 1 to 3 years of experience (n=60; 28.4%). Minority of the staff nurse respondents have 4 to 6 years (n=20; 9.5%), 7 to 9 year (n=2; 0.9%), and more than 9 years (n=5; 2.4%). The increased number of respondents belonging to less than 1 year of hospital experience may be due to the rapid turnover of graduate nurses produced by the country to work in hospitals

locally or abroad. This implied that most of staff nurses are novice nurses which may affect the ability to perform correct infection control measures like proper care of the stethoscope.

With multiple responses as to clinical area of practice for the past 6 months, it is revealed that most of the respondents practiced in Medical-Surgical ward (n=130; 26.5%), Obstetrical ward (n=77 or 15.7%), Pediatric ward (n=75; 15.3%) and Emergency Room (n=59; 12.0%). Few had their clinical area of practice in special areas of the hospital which included the Operating Room (n=40; 8.2%), Delivery Room (n=39; 7.9%), Intensive Care Unit (n=35; 7.1%) and Hemodialysis (n=22; 4.5%); and Out-Patient Department (n=14; 2.8%). The findings of the study revealed that most of the respondents had their clinical area of practice in Medical-Surgical area where infectious cases are apparent. Thus, this implied that nosocomial infection may occur easily if aseptic practices are not considered in the workplace.

Table 2: Ownership and Source of Stethoscope Use by the Nurse Respondents

Table 2: Ownership and Source of Stethoscope Use	Frequency	Percentage (%)
Owned: Shares with:	46	21.8
<i>Doctor: 1 (2.2%)</i>		
<i>Co-Nurses: 44 (95.6%)</i>		
<i>Midwife: 1 (2.2%)</i>		

Not Owned: Borrows from:	165	78.2
<i>Doctor: 6 (3.6%)</i>		
<i>Co-Nurses: 19 (11.5%)</i>		
<i>Midwife: 8 (4.9%)</i>		
<i>Hospital Supply: 132 (80.0%)</i>		
TOTAL	211	100.0%

The type of ownership and source of stethoscope use is presented in Table 2. The study findings revealed that majority of the nurse respondents do not own stethoscope (n=165; 78.2%) while minority of the respondents have their own stethoscope (n= 46; 21.8%). The stethoscopes used by nurses who do not own one are borrowing from other members of the health care team. Most of the nurse respondents borrow stethoscope from the hospital supply from (n=132; 80.0%), from their co-nurses (n=19; 11.5%), from midwives (n=8; 4.9%), and from doctors (n=6; 3.6%). On the other hand, nurses who owned their stethoscope share stethoscopes with their co-nurses (n=44; 95.6%), midwife (n=1; 2.2%), and doctor (n=1; 2.2%).

Stethoscopes get contaminated by the organisms colonized on the patients' skin, or those resident on the hands or outfits of the health care providers, or when they come in contact with blood and other biological secretions (Parmar, 2004). In their study,

the universal use of the stethoscope and its direct contact with multiple patients makes it an important potential factor in the dissemination of microorganisms from one patient to another. In hospitalized patients, this means an exposure of an already susceptible host to a higher microbial overload and for the patients attending Out-Patient Department, an exposure to the ominous antibiotic-resistant hospital-flora. This is of particular relevance while treating renal transplant recipients, immunocompromised host, following cardiac surgery, take for instance, mitral valve replacement at the risk of serious infections. This implies the importance of the owning the stethoscope being used in the clinical area to prevent possible transmission of pathogenic microorganisms. The stethoscope is a universal instrument used by health care providers and it is of utmost importance that each health care team member must own this instrument to reduce the likelihood of transfer of microorganisms.

Table 3: Stethoscope Use and Care (Owned) by the Nurse Respondents

Stethoscope Use and Care (Owned) by the Nurse Respondents		
A. Type of Stethoscope	Frequency	Percentage (%)
<i>With Bell</i>	44	95.6
<i>Without Bell</i>	2	4.4
TOTAL	46	100.0%
B. Duration of Use of Stethoscope		
<i>Less than 6 months</i>	5	10.8
<i>6 months-1 year</i>	9	19.6
<i>1-3 years</i>	22	47.8
<i>4-6 years</i>	9	19.6
<i>More than 6 years</i>	1	2.2
TOTAL	46	100.0%
C. Frequency of Stethoscope Care		
<i>Once Daily</i>	16	34.7
<i>Once Weekly</i>	13	28.3
<i>Once Monthly</i>	12	26.1
<i>Once Yearly</i>	3	6.5
<i>Never</i>	2	4.4
TOTAL	46	100.0%

Table 3 shows stethoscope use and care by nurses who own their stethoscope in clinical practice. This also shows the frequency and distribution of type of stethoscope, duration, frequency, and last time of stethoscope care. Out of the 46 nurse respondents who own their stethoscopes, majority of the stethoscopes have bell (n= 44; 95.6%) and minority are without bell (n= 2; 4.4%).

In terms of the duration of use of stethoscope, the study findings also revealed that almost half of the nurse respondents are using their owned stethoscope for about 1 to 3 years (n=22; 47.8%). On the other hand, minority of the nurse respondents are using the stethoscope for 6 months to 1 year (n=9; 19.6%); and 4 to 6 years (n=9; 19.6%). Very few of the nurses are using the stethoscope for less than 6 months (n=5; 10.8%); and only 1 (2.2%) nurse is using her owned stethoscope for more than 6 years.

In relation to the stethoscope use, most of the nurses clean their stethoscope on a daily basis (n=16; 34.7%), weekly basis (n=13; 28.3%); monthly basis (n=12; 26.1%). Surprisingly, minority of the nurse respondents clean their stethoscope once a year (n=3; 6.5%) and never practice stethoscope care (n=2; 4.4%). The increased frequency of stethoscope cleaning on a daily and weekly basis implied that nurses'

practices infection control measures in preventing nosocomial infection through proper care of stethoscope.

The Center for Disease Control and Prevention (2007) stated that Methicillin-resistant *Staphylococcus aureus* (MRSA) has become a prevalent nosocomial pathogen in the United States. In hospitals, the most important reservoirs of MRSA are infected or colonized patients. Although hospital personnel can serve as reservoirs for MRSA and may harbor the organism for many months, they have been more commonly identified as a link for transmission between colonized or infected patients. The main mode of transmission of MRSA is via hands (especially health care workers' hands) which may become contaminated by contact with a) colonized or infected patients, b) colonized or infected body sites of the personnel themselves, or c) devices, items, or environmental surfaces contaminated with body fluids containing MRSA including stethoscopes. It has been advocated that stethoscope cleaning should be performed on a daily basis. It is said that about one third of all nosocomial infections are preventable. The stethoscope, a universal tool of medical profession is often used on multiple patients (Verghese & Patel, 1999). It is of prime importance that this instrument be cleaned on a regular basis.

Table 5: Utilization of Stethoscope

A. Procedures involving Stethoscope Use	1	2	3	Average Rank	Rank
<i>Blood Pressure Taking</i>	192	11	8	1.13	1
<i>Chest Auscultation</i>	12	169	30	2.09	2
<i>Abdominal Auscultation</i>	7	31	173	2.79	3
B. Patient's Body Part in Contact with Stethoscope**	Frequency		Percentage (%)		
<i>Upper Arm</i>	138			28.1	
<i>Chest</i>	128			26.0	
<i>Abdomen</i>	123			25.0	
<i>Back</i>	97			19.7	
<i>Thigh</i>	6			1.2	
TOTAL	492			100.0%	

****Based on Multiple Responses**

The next table presents utilization of stethoscope involving the procedures where it is used. Blood pressure taking ranks first with an average rank of 1.13, followed by chest auscultation with an average rank of 2.09 and lastly abdominal auscultation with an average rank score of 2.79. The increased frequency of blood pressure

taking corresponds with the upper arm being the most common body part in contact with the stethoscope.

In accordance with its utilization is the body part of the patient that frequently gets into contact with the stethoscope. The study findings revealed that the most frequent part that gets into contact

with the stethoscope is the upper arm (n=138; 28.1%) followed by the chest (n=128; 26.0%), abdomen (n=123; 25.0%) back (n=97; 19.7%) and thigh (n=6; 1.1%).

Stethoscopes get contaminated by the organisms colonized on the patients' skin, or those residents on the hands or outfits of the health care providers, or when they come in contact with blood and other biological secretions. In their study, the universal use of the stethoscope and its direct contact with multiple patients makes it an important potential

factor in the dissemination of microorganisms from one patient to another (Parmar, 2004). *Staphylococcus aureus* is a type of bacteria commonly carried on the skin, in the nares, and on the perineum of healthy people (Yamamoto & Marten, 2007). The contact of this stethoscope to patient's skin is inevitable but the most important preventive measure to avoid infection associated with the use of this instrument is through meticulous and regular stethoscope cleaning.

Table 6A: Stethoscope Care Before Use

A. Level of Frequency	Frequency	Percentage (%)
Not frequently	120	56.9
Always	57	27.0
Never	34	16.1
TOTAL	211	100.0%
B. Cleaning Method Used	Frequency	Percentage (%)
Swab using cotton with isopropyl alcohol	172	97.2
Swab using a dry cloth	4	2.3
Swab using dry cotton	1	0.5
TOTAL	177	100.0%

Table 6A illustrate care of the stethoscope before use. Care of the stethoscope before use is presented according to the level of frequency and cleaning method utilized. It is indicated in the table that majority of the nurse respondents is not frequently (n=120; 56.9%) cleaning their stethoscope before usage. Whereas some nurse respondents always (n= 57; 27.0%) clean their stethoscope before use while minority of the nurse respondents never clean their stethoscope before utilization for patient care (n=34; 16.1%). The table also presents that majority of the respondents make

use of cotton swab with alcohol (n= 172; 97.2%) during stethoscope cleaning.

Studies have indicated that rubbing alcohol pads on stethoscope diaphragms can reduce bacterial colonization, and it has been suggested that cleansing of stethoscopes daily may be as effective as more frequent cleaning (Hill, 2006). Unfortunately, many clinicians do not clean their stethoscopes on a regular basis. In addition, alcohol pads are not always available, and using them requires an extra step and produces waste.

Table 6B: Stethoscope Care after Use

Level of Frequency	Frequency	Percentage (%)
Not frequently	123	58.3
Always	48	22.7
Never	40	19.0
TOTAL	211	100.0%
Method Used	Frequency	Percentage (%)
Swab using cotton with isopropyl alcohol	155	95.1
Swab using a dry cloth	5	3.1
Swab using dry cotton	2	1.2
Wash using alcohol	1	0.6
TOTAL	163	100.0%
Stethoscope Parts Being Cleaned	Frequency	Percentage (%)

Diaphragm	147	31.2
Earpiece	134	28.5
Bell	90	19.1
Ear tubes	45	9.6
Tubing	32	6.8
Tension bar	23	4.8
TOTAL	471	100.0%
Placement After Use	Frequency	Percentage (%)
BP Apparatus Pouch	141	66.8
Table	41	19.4
Bag	22	10.4
Nape	7	3.4
TOTAL	211	100.0%

Table 6A illustrate care of the stethoscope before use. Care of the stethoscope before use is presented according to the level of frequency and cleaning method utilized. It is indicated in the table that majority of the nurse respondents is not frequently (n=123; 58.3%) cleaning their stethoscope before usage. Whereas, minority of the nurse respondents always clean (n= 48; 22.7%) and never clean their stethoscope before utilization for patient care (n=40; 19.0%). The table also presents that majority of the nurse respondents make use of cotton swab with alcohol (n= 155; 95.1%) during stethoscope cleaning. The results indicate an alarming implication for nurses who do not practice regular stethoscope care after use. Stethoscopes should be cleaned after each use in order to avoid the spread of infection. This precaution is especially important when they are placed directly onto bare skin (Guinto, 2002).

The findings of the study revealed that the majority of respondents obtained from nurse respondents that the most commonly cleaned parts of the stethoscope after use includes the diaphragm (n=147; 31.2%), earpiece (n=134; 28.5%) and bell (90 or 19.1%). On the other hand, minority of the responses from the respondents just clean the ear tubes (45 or 9.6%), tubing (32 or 6.8%) and tension bar (23 or 4.8%). On the other hand, majority of the responses from the respondents place their stethoscope after use in the blood pressure apparatus pouch (n=141 or 66.8%). This is followed by placing the stethoscope in the table (n=41 or 19.4%), bag (22 or 10.4%), and nape (7 or 3.4). According to 3M Littmann Stethoscope's manufacturer, the majority of tubing used on stethoscopes is made of PVC (polyvinylchloride) which becomes hard when exposed for long periods

of time to the lipids found in human skin. Therefore, wearing the stethoscope around the neck may cause stiffening of the tubing over time.

CONCLUSION AND RECOMMENDATIONS

The aforementioned significant data of the study conducted on 5 different hospitals of Pampanga indicated the practices employed by the respondents regarding care of the stethoscope. Based from the data gathered for the study, the following presents the major findings of the study:

- The respondents of the study were mostly staff and volunteer nurses having less than a year of experience in the hospital. Clinical areas of practice were most concentrated on Medical-Surgical and Obstetrical Wards.
- A huge number of the respondents did not own their stethoscope and usually relied on hospital supply as the main source of stethoscope use.
- The stethoscopes that were owned by some respondents were mostly bell-stethoscopes and were used for duration of 1 to 3 years. Most respondents cleaned their stethoscopes daily and were able to clean them yesterday in reference to the time of data collection.
- A great majority of the respondents were able to identify the parts of the stethoscope where bell and diaphragm were the parts mistakenly identified.
- Stethoscopes were used most frequently during blood pressure taking followed by chest auscultation which corresponded with upper arm and chest as body parts in usual contact with the stethoscope.

- Majority of the respondents infrequently cleaned stethoscopes before and after use utilizing cotton alcohol swab for cleaning. Earpiece and diaphragm were the commonly cleaned parts of the instrument before and after use. Stethoscopes were usually placed in the BP apparatus pouch after usage.

Grounded on the results and findings of the study, the researchers wish to extend the conclusions and recommendations which are derived and formulated significant to the practice of nursing in the hospital and other health care institutions. The following are imperative key points emanated from the research study concerning stethoscope care by nurses in hospitals which can serve as a basis for control of nosocomial infection. These key points may serve as recommendations as well, in the pursuance of improving health care practice in institution where patients become the recipients of quality health care services.

Ownership and Personal Responsibility of one's stethoscope

A sense of ownership must be achieved by every nurse practicing in the hospital. It is in this regard that when one owns the stethoscope being used, personal responsibility concerning stethoscope care can be easily attained. The one most responsible in cleaning the stethoscope is none other than the health care provider who makes use of it. Every after patient contact with the stethoscope, the nurse has the greatest knowledge as to which part should be cleaned most meticulously. If this is practiced, it can be justified that the maintenance of the said instrument can be continued and nosocomial infection involving methicillin-resistant staphylococcus aureus can be eliminated.

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Basic education on the stethoscope

It is surprising to note from the study that none of the parts of the stethoscope was correctly identified by all of the respondents in the research. In addition, the diaphragm and bell were the parts most commonly confused. If the parts were mistakenly identified, it is unfortunate to assume that nurses, to some instances, may not be able to justify correctly the intended purposes of using a bell and a diaphragm. In the same way, basic education concerning stethoscope parts, cleaning and storage be emphasized among nurses since the stethoscope is an indispensable instrument in the practice of nursing.

Proper Stethoscope Care

It is alarming to communicate the result of the study indicating that nurses infrequently clean the stethoscope before and after use. Some respondents even never cared to clean their stethoscopes after patient care on procedures like blood pressure taking, chest and abdominal auscultation. MRSA infection may occur if care of the stethoscope is not maintained. Care of the stethoscope is not solely confined on cleaning but storage as well. Storing stethoscopes in clean places is as important as cleaning the stethoscopes.

Microscopic Determination of Stethoscopes

The study aimed at exploration of the practices employed by the nurses in different hospitals of Pampanga regarding the care of the stethoscope. The practices were identified concerning frequency, agent used, method utilized and parts of stethoscope cleaned. The study, however, did not undergo microscopic determination of microorganisms in the stethoscope. To establish connection of stethoscope care practices to the colonization of microorganisms in stethoscopes, descriptive identification of the pathogens may be useful.

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