

RESEARCH ARTICLE

Knowledge and Compliance to Standard Precautions and General Self Efficacy among Nurses in a Tertiary Hospital

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Abstract

Purpose: This study aimed to evaluate the level of knowledge on Standard Precautions, level of compliance to Standard Precautions, and General self-efficacy of nurses in a tertiary hospital. Also, this study aimed to identify the relationship between those variables.

Design and Methods: A descriptive correlational research design was utilized in the study. 168 nurses from the tertiary hospital from Nueva Ecija, Philippines were recruited to complete a questionnaire about their knowledge and compliance to Standard Precautions and their General self-efficacy. The data was coded, encoded, and statistically analyzed using PSPP 1.2.0 (GNU Project. New York City, New York, USA).

Results: Findings indicated that nurses have good knowledge and high compliance concerning standard precautions; also, findings showed that nurses have a moderate level of general self-efficacy. However, there was no remarkable relationship between the level of knowledge, level of compliance in Standard Precautions, and general self-efficacy.

Conclusions: Although the researcher concluded a high level of knowledge among nurses, statistical analysis showed no relationship when correlated with compliance. This concluded that knowledge of Standard Precautions does not necessarily influence compliance and its application. Also, findings inferred that a moderate level of general self-efficacy did not act upon the level of compliance of nurses to Standard Precautions.

Keywords: *Standard Precaution, Compliance, Knowledge, General Self-efficacy.*

Introduction

“Standard Precautions are minimum infection prevention practices used for all patient care, regardless of infection status and setting where health care is delivered. It prevents the transmission of diseases that can be contracted by exposure to blood, non-intact skin, body fluids, and mucous membranes. Standard Precautions are composed of the use of personal protective equipment, hand hygiene, respiratory hygiene/cough etiquette, safe injection practices, sharps safety, sterile instruments and devices, and cleaning and disinfected environmental surfaces” (Centers for Disease Control and Prevention, 2019).

Compliance with Standard Precautions guidelines has been a problem for the health care system universally. A break in the principle of Standard Precautions threatens the welfare of the patients and health care providers. It is indeed vital to adhere to

Standard Precautions, most importantly now that there are a lot of emerging deadly diseases like COVID-19. Low compliance in Standard Precautions enables the transmission of infection from patients to health care workers and other patients (World Health Organization, 2011). At any given time, seven percent in developed and ten percent in developing countries, including the Philippines, will acquire at least one healthcare-associated infection. Death from healthcare-associated infection occurs in about ten percent of affected patients (World Health Organization 2011). Also, low compliance in Standard Precautions places healthcare workers at high risk of acquiring infectious diseases like HIV infection, Hepatitis B, and Hepatitis C following occupational exposure (Centers for Disease Control and Prevention, 2002). At times, it may also be a cause for an outbreak in the community (World Health Organization, 2011).

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Knowledge and compliance with standard precautions and general self-efficacy are crucial to protect not only the patients but also medical workers from exposure to communicable diseases. The relationship between these variables may predict the success in compliance with Standard Precautions in preventing hospital-acquired infections.

This study aimed to evaluate the level of knowledge on and level of compliance to Standard Precautions, and the level of general self-efficacy among nurses working in a tertiary hospital. Also, it aimed to uncover relationships between those variables.

Methodology

A descriptive correlational research design was utilized to identify the relationship between level of knowledge on Standard Precautions, level of compliance to standard precautions, and level of general self-efficacy among nurses in a tertiary hospital.

The researcher used simple random sampling by securing a list of the member of the population. Each member was marked with a specific number and randomly chosen by the use of random number generator software (Stat Trek). Sample population of 168 nurses of a tertiary hospital was calculated through OpenEpi, with an assumption prevalence of 50, a study population of 295 nurses, a confidence level of 95%, and an allowable error of 5.

The researcher started the data collection from August 10 to October 30, 2020, after securing ethical clearance. The researcher conducted data collection in an empty room in the nursing office without any person except the respondents and the researcher who administered the questionnaire after the informed consent was presented. Respondents completed the questionnaires encoded in Google Docs. The link to the questionnaire was sent to their emails. The researcher made himself available throughout the study to explain the procedure, maintain privacy and confidentiality of the study, and cater to further concerns and queries.

The researcher utilized a validated self-report questionnaire used by Lou, et al., (2009) in their study "Factors affecting compliance with Standard Precautions in nursing, China." The researcher had a minimal revision on the respondents' profile part. The researcher did not conduct pretesting and pilot study since it was already validated. A letter through e-mail was sent to previous researchers to ask permission to use the questionnaires. Pasay et al (2015). also utilized the said set of questionnaires excluding the general self-efficacy scale in their study 'Compliance with Standard Precaution among Hospital Nurses in Ozamiz City, Philippines'. The general self-efficacy

scale (GSES) was pioneered by German psychologist Schwarzer and colleagues in 1981 which gives a good representation of self-efficacy in different settings.

The researcher sorted and checked the questionnaires for completeness to determine their usability. A total of 168 copies of the questionnaire were distributed and were returned to the researcher garnering a 100% return rate.

The data was encoded and statistically analyzed using PSPSP 1.2.0 (GNU Project. New York City, New York, USA). Frequency and percentage distribution were used in the presentation of the demographic profile of the respondents. The mean scores were computed for the level of knowledge, general self-efficacy, and compliance, and were categorized from low to high. Pearson's correlation was utilized for the analysis of the relationship between knowledge and compliance with Standard Precautions, and general self-efficacy. The researcher observed ethical approaches in all areas of research by taking into consideration ethical issues related to data collection such as confidentiality, risks, and benefits. The research locale issued the ethical clearance after a thorough evaluation.

Results and Discussion

Demographic Profile of the Respondents

Table 1 showed the distribution of the respondents' answers to the demographic question. The age of respondents was predominantly between 20 to 29 years old (42.86%) and aged 30 to 39 years old (41.68%). Of the sample of 168, 108 were female, and 60 were male with a corresponding percentage distribution of 64.29% and 35.71%, respectively. Out of 168 nurses, 33.93% were master's degree holders, and one nurse has a Doctorate (0.6%). The respondents mostly comprised of 4-6 (42.29%) years of experience. Most of the respondents were from the Operating Room (11.31%) Emergency Department (11.31%), Female Medical Ward (9.52%), Pediatric Ward (8.93) Surgical Complex (8.33%). 122 (72.69%) of the surveyed nurses have training on Standard Precaution.

Age of Respondents

Data revealed that out of 168 nurses surveyed, 42.86% of nurses aged between 20 to 29 years old, 41.68% of nurses aged between 30 to 39 years old, 8.33% of nurses aged between 40 to 49, and 7.14% of nurses aged above 50 years old. The sample population was dominated by nurses aged between 20 to 29 years old (42.86%) and aged 30 to 39 years old (41.68%). It implied that most of the respondents are part of the millennial generation. "Millennial generation exhibits a capacity for high-

Table 1. Respondents' Demographic Profile

Variable	Frequency	Percentage
Sex		
Female	108	64.29
Male	60	35.71
Age		
20-29 years	72	42.86
30-39 years	70	41.67
40-49 years	14	8.33
50 above	12	7.14
Educational Attainment		
College Graduate	110	65.48
Master's Degree	57	33.93
Years of Experience		
1-3 Years	22	13.1
4-6 Years	71	42.26
7-9 Years	25	14.88
10-12 Years	15	8.93
13-15 Years	12	7.14
16-18 Years	3	1.79
19-20 Years	5	2.98
Greater than 20 years	8	4.76
Training on Standard Precautions		
Yes	122	72.62
No	46	27.38
Area of Assignment		
Blood Bank	3	1.79
ENT-Ophtha Ward	1	0.6
Emergency Department	19	11.31
Emergency Room- OB	4	2.38
Female Medical Ward	16	9.52
Hemodialysis Unit	8	4.76
Labor and Delivery Room	5	2.98
Male Medical Ward	11	6.55
Medical ICU	8	4.76
Neonatal ICU	6	3.57
Nursing Office	8	4.76
Obstetrics- Gynecology Ward	13	7.74
Operating Room	19	11.31
Orthopedic Ward	5	2.98
Out-Patient Department	8	4.76
Pediatric Ward	15	8.93
Post- Anesthesia Care Unit	1	0.6
Stroke Unit	1	0.6
Surgical Complex	14	8.33
Surgical ICU	3	1.79
n=168		

level cooperative work, confidence, ambition, optimism, conventionality and at the same time, they can be easily stressed out" (Wilson & Gerber, 2008). Understanding generation differences allow leaders to enhance and sustain a culture of compliance. Studies showed that older nurses have higher compliance in standard precautions (Pasay et al., 2014), while 20-30 years old nurses ranked lowest on compliance, similar to the findings of Chan et al. (2002). However, the studies of Gebresilassie, et al. (2014), say that older nurses have a higher resistance to behavior change in compliance to standard precaution. According to their reports, it is because of the experiences and training attended.

Sex of Respondents

Most of the respondents were female (64.29%), while 35.71% were male. World Health Organization (2015) said that women were a significant part of healthcare in many countries since they comprise 75% of the workforce. Concerning gender, Pasay et al. (2015) reported that male nurses have better compliance with standard precautions, same with the findings of Efstathiou et al. (2007). While in the studies of Yassi, et al. (2007) and Creedon (2008), female nurses are more compliant with standard precautions.

Educational Attainment of Respondents, Year of Experience, Training on Standard Precaution

Out of 168 nurses, 33.93% were master's degree holders, and one nurse has a Doctorate, which mostly comprised of respondents with 4-6 years of experience (42.26%). 122 (72.69%) of the surveyed nurses have training on Standard Precaution. Education is an essential element in the training of healthcare workers, particularly in countries where there is a lack of infection control programs. Lack of understanding and training are factors affecting compliance with Standard precautions. Lou et al., 2009 concluded that nurses who undergone training had greater precaution compliance than those without Standard precautions training. However, a study in Iran showed that nurses with a Master's degree despite having higher scores in knowledge in Standard precautions did not reach a satisfactory score for compliance in Standard Precautions (Askarian et al., 2007).

Level of Knowledge on Standard Precautions

Table 2 presents the answers concerning the knowledge of the respondents on Standard Precautions.

Success in the implementation of Standard Precautions guidelines depends on health care workers receiving continuing education. A good level of knowledge with Standard Precautions was observed throughout the study, which is an excellent indicator of the possible decline in healthcare-associated infections; however, some areas need to be reinforced. Standard precaution's primary goal was severely neglected by the respondents and believed that Standard Precautions was solely used in patients diagnosed with infection or patients suspected of

infectious disease. Respondents' knowledge was also deficient when it comes to diseases' mode of transmission, especially those diseases transmitted airborne.

Findings indicated that nurses have good knowledge concerning standard precautions in comparison with the previous studies. 99.40% of the respondents know what is Standard Precaution, and 91.67% were aware that the main objective of adherence to Standard Precautions is not only to protect the healthcare team but also other patients. However, 29.17% of nurses have not recognized that Standard Precautions should be used not only in patients diagnosed with infection or patients suspected of the infectious disease but also to all patients regardless of their diagnosis.

Table 2. Responses to Questions Regarding Knowledge on Standard Precautions

QUESTIONS	Correct Answer	f	%
1. Do you know what the Standard Precautions measures are?	Yes	167	99.40
2. Standard Precautions should only be used in patients diagnosed with infection or patients suspected of infectious disease	No	119	70.83
3. The main objective of adherence to Standard Precautions is to protect the healthcare team.	No	154	91.67
4. Do you wash hands immediately in case of contact with blood or any other potentially contaminated materials	Yes	168	100
5. Hand hygiene should be performed before and after providing care to different patients	Yes	165	98.21
6. When performing procedures that may involve contact with the patient's mucous membranes, the use of gloves is not mandatory	No	147	87.5
7. Since gloves may prevent hand contamination, it is not necessary to wash hands after removing gloves	No	147	87.5
8. Contact with objects, materials, equipment, clothing, and individuals with contaminated Personal Protective Equipment (PPE) should be avoided	Yes	157	93.45
9. Personal Protective Equipment should not be shared	Yes	163	97.02
10. In blood collection or venipuncture procedures, the use of gloves is required	Yes	167	99.40
11. In procedures where contact with secretion or excretion is imminent, glove use is required	Yes	167	99.40
12. Gloves should be changed when caring for one patient to another.	Yes	167	99.40
13. In procedures where there is a possibility of blood, body fluid, secretions, or excretions spilling, protective masks or face shields should be used	Yes	167	99.40
14. In procedures where there is a possibility of blood, body fluid, secretion, or excretion spilling, personal protective goggles or face shields should be worn	Yes	165	98.21
15. In procedures where there is a possibility of blood, body fluid, secretion, or excretion spilling, a protective apron should be worn	Yes	164	97.61
16. In situations where blood splatters, body fluid, secretion, or excretion may occur, disposable caps and hats should be used	Yes	157	93.45
17. It is forbidden to bend or recap needles. When necessary, perform the one-hand recapping method. Puncture Proof containers should be near the handling area	Yes	155	92.26
18. When providing nursing care to patients with hepatitis B or syphilis, it is only necessary to adopt the Standard Precautions measures	Yes	137	81.55
19. When providing nursing care to patients with active tuberculosis or chickenpox, it is only necessary to adopt the Standard Precautions measures in addition to the droplet precautions measures	No	33	19.64
20. When providing nursing care to patients with intestinal infections or skin infections, Standard Precautions should be taken in addition to contact precautions	Yes	163	97.02

Table 3. Level of Compliance of Nursing Personnel

Compliance Questions	Weighted Mean
1. I perform hand hygiene in the interval between providing care to different patients.	3.86
2. I perform hand hygiene after removing the gloves.	3.93
3. I wash my hands immediately after contact with potentially contaminated biological materials.	3.99
Frequency of glove use in procedures where there is a possibility of contact with potentially contaminated biological materials	
4. Blood collection	3.93
5. Procedures involving the possibility of contact with urine or feces	3.97
6. Procedures involving the possibility of contact with the patient's non-integral skin	3.92
7. Procedures involving the possibility of contact with the patient's mucosa	3.96
8. Procedures involving the possibility of contact with secretions of the airway of the patient	3.96
9. Intramuscular or subcutaneous injection	3.66
10. Dressing	3.88
11. Cleaning for blood removal	3.93
12. Venous puncture	3.83
13. Contact with blood samples	3.92
14. I use a protective mask when there is a possibility of contact with blood splash, body fluid, secretion, or excretion	3.89
15. I wear protective glasses when there is a possibility of contact with blood splash, body fluid, secretion, or excretion	3.6
16. I use a protective apron when there is a possibility of contact with blood splash, body fluid, secretion, or excretion.	3.45
17. I use disposable hats and surgical shoe when there is the possibility of contact with blood splash, body fluid, secretion, or excretion.	3.24
18. I do not perform active recapping of used needles or perform passive recapping of needles with only one hand.	3.63
19. Discard needles, blades, and other sharps materials in specific waste containers	3.99
20. After work accidents with potentially contaminated sharpening materials, immediately squeeze the site, then perform the antisepsis and put on a dressing	3.7
Total:	3.81

All respondents wash their hands immediately in case of contact with blood or any other potentially contaminated materials, and 98.21% believed that hand hygiene should be performed before and after providing care to different patients.

Data showed that 12.5% of the respondents thought that glove was not mandatory when performing procedures with the patient's mucous membranes. Moreover, respondents thought that it was not necessary to wash hands after removing gloves. However, 99.40% of the respondents recognized that gloves should be changed when caring for one patient to another; also, respondents were aware that in blood collection or venipuncture procedures and contact with secretion or excretion, the use of gloves was required. According to Mahony (1998), gloves do not eliminate 100% contamination of pathogens because fluids are still capable of passing through the microscopic holes in the gloves.

Most of the respondents were knowledgeable about the proper use of personal protective equipment. Data showed that 97.02% of respondents believed that PPE should not be shared and contact with objects, materials, equipment, clothing, and individuals with contaminated Personal Protective Equipment (PPE) should be avoided (93.45%).

There were respondents (7.74%) who still thought that bending or recapping needles was not forbidden.

Some respondents (18.45%) thought that it was not necessary to adopt the Standard Precautions measures when providing nursing care to patients with hepatitis B or syphilis, which is very dangerous since syphilis and hepatitis B can be acquired through contact with infected blood. Measles, Tuberculosis and Varicella, can be acquired via airborne transmission, and 80.36% of the respondents thought that only Standard Precaution in addition to the Droplet precautions was the necessary measure to avoid those diseases.

Level of compliance of nursing personnel on Standard Precautions

The finding showed that nurses were compliant with Standard Precautions contradicting several previous studies. Table 3 presents the answers concerning the compliance of the respondents on Standard Precautions.

Compliance with handwashing was extremely high. It can be associated with the posters/signage and daily reiteration from infection control nurses. Respondents were compliant in using

Table 4. General Self-Efficacy of Nurses

General Self-Efficacy Questions	Weighted Mean
1. I can always manage to solve difficult problems if I try hard enough.	2.92
2. If someone opposes me, I can find the means and ways to get what I want.	2.45
3. It is easy for me to stick to my aims and accomplish my goals.	2.91
4. I am confident that I could deal efficiently with unexpected events.	2.96
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	2.96
6. I can solve most problems if I invest the necessary effort.	3.05
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	2.96
8. When I am confronted with a problem, I can usually find several solutions.	2.96
9. If I am in trouble, I can usually think of a solution	2.99
10. I can usually handle whatever comes my way.	2.95
Total:	2.91

gloves when performing procedures involving the possibility of contact to urine, feces, non-intact skin, mucosa, blood samples, and secretions. However, the researcher investigated that nurse tend to forget to use gloves during the intramuscular and subcutaneous injection, possibly because, during training, lecturers reiterated that gloves are usually not necessary if there was no bleeding that could result in hand contact with blood. Compliance with the use of an apron, protective glasses, disposable hats, and surgical shoes when there was a risk of splashes or spray of blood and body fluids was relatively low. It can be associated with the unavailability of materials, or nurses were unaware of the availability of the material in the facility. This finding is similar to the study conducted by Labrague, et al., (2012), Luo (2009), et al., and Sadoh, et al. (2006). Compliance in the disposal of sharps and used needles in a specific container was relatively high. However, the researcher observed that the respondents have low compliance when it comes to active recapping of used needles or perform passive recapping of needles with only one hand, which resulted in needle stick injury among respondents. Needle-stick injury was prevalent and usually unreported.

Level of General Self-efficacy of Nurses

Nurses described their confidence in perceived situations and how they behave in different situations as average (see Table 4).

These findings equated to an average level of perception in individuals' capabilities to organize and apply the courses of action needed to accomplish a specific goal. Bandura's (1997) social cognitive theory considers self-efficacy as one of its core concepts. Also, it was considered as an influential parameter affecting the quality of clinical practice and nurses' perceived professional benefits (NPPB) (Cheng et al 2020). "People who are low in self-efficacy tend to see difficult tasks as threats they should avoid and tend to avoid setting goals and have low levels of commitment to the ones they do make" (Bandura, 1997). Several studies have evaluated the effect of self-efficacy in maintaining an optimistic attitude, reducing job burnout, and increasing positive emotion (Stajcovic et al. 2018). "Some researchers have reported that self-efficacy can improve an individual's confidence to provide nursing practice in a complex situation" (Pike et al., 2010)

Relationship between Knowledge in Standard Precautions, Compliance in Standard Precautions, and General Self Efficacy.

The data shown in Table 5 correlate the level of knowledge and compliance in Standard Precautions to self-efficacy.

Although the researcher concluded a good level of knowledge among nurses, statistical analysis (Pearson r value of 0.279)

Table 5: Relationship between Knowledge, Compliance, and General Self Efficacy.

		Independent		Dependent
		Knowledge	Compliance	Self-Efficacy
Knowledge	Pearson Correlation	1	0.08	0.02
	Sig. (2-tailed)		0.279	0.81
Compliance	Pearson Correlation	0.08	1	-0.05
	Sig. (2-tailed)	0.279		0.492
General Self-Efficacy	Pearson Correlation	0.02	-0.05	1
	Sig. (2-tailed)	0.81	0.492	

*Significance level, $\alpha = 0.05$, $N=168$

showed no relationship when correlated with compliance. This denotes that knowledge of Standard Precautions does not necessarily influence compliance and its application. These findings supported Pasay et al.'s (2015) study while contradicting studies of Lou et al. (2009) and Lambrague et al. (2012), which reported that lack of knowledge is the primary reason for non-adherence to standard and isolation precautions. The coefficient of correlation obtained using Pearson r is 0.492 when the level of compliance was correlated to level general self-efficacy. This statistical analysis showed an average level of general self-efficacy has no relationship when correlated with compliance with Standard Precautions. This finding denoted that self-efficacy did not necessarily influence the compliance of nurses to Standard Precautions. These findings sided the study of Lou et al. (2009) which proved that general self-efficacy cannot consider as a crucial determinant to skill performance in compliance with Standard Precautions.

Conclusions

The majority of the respondents were female and aged between 20 to 39 years old. The age denoted that most nurses belonged to the Millennial generation. A great number have worked in the hospital mostly for 4-6 years with Standard Precaution training. Most of the respondents hailed from the Operating Room, Emergency Department, Female Medical Ward, Pediatric Ward, and Surgical Complex.

A good level of knowledge and high-level compliance with Standard Precautions were observed throughout the study. This is an excellent indicator of the possible decline in healthcare-associated infections; however, some areas need to be reinforced.

Nurses described their self-efficacy as an average which denoted an average level of perception in individuals' capabilities to organize and apply the courses of action needed to accomplish a specific goal.

Although the researcher concluded a high level of knowledge and the average level of general self-efficacy among nurses, statistical analysis showed no relationship when correlated with compliance. This concluded that knowledge and general self-efficacy do not necessarily influence compliance and its application.

Recommendations

This study showed that the level of compliance was found to be very high among respondents; however, certain areas need to improve specifically in using a glove, eye shield, and apron during a procedure. The researcher recommended the strict

implementation of the protocol and strict audit in compliance with Standard Precaution. Also, training in standard precautions must be communicated not only to nurses but also to other health care workers. The infection control committee of different institutions should strictly implement Standard Precaution protocol and do routine surveillance. Moreover, they should revisit the existing protocol and revise with the present status quo, availability of materials, and several workforces in their facility.

Since no correlations were found with knowledge, level of compliance with Standard Precautions with self-efficacy when using a self-administered questionnaire, a follow-up study that incorporates actual observation in data collection is recommended. Actual observation is a direct method for collecting data best for the study of human behavior. Moreover, the data collected is accurate in nature and improves the precision of the research result.

Even though it was found out that nurses have a very high level of compliance with standard precautions, leaders and educators should also create an effective compliance program to ensure that their workforce is following written policies and code of conduct that the institution set.

The future researcher might also consider hours of duty as a factor that may affect compliance with Standard Precautions since limited attention has been paid to the prolonged hours worked by nurses or the effects of these hours on patient safety.

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Acknowledgment

The author wishes to acknowledge the guidance of Dr. Alexander Tiongson and Mrs. Pinky Miriam Canlas MAN, RN.