

FACTORS AFFECTING THE COMPLIANCE OF MYANMAR NURSES IN PERFORMING STANDARD PRECAUTION

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ABSTRACT

Introduction: Exposure to pathogens is a serious issue for nurses. The literature explains that standard precaution has not consistently been done in nursing. The purpose of this study was to analyze the factors affecting the compliance of nurses in Myanmar in performing standard precautions. **Methods:** This study used a cross-sectional design. Samples included 34 nurses in Waibagi Specialist Hospital (SHW), Myanmar. The independent variables were the characteristics of nurses, knowledge of standard precaution, and exposure to blood/body fluids and needle puncture wounds. The dependent variable was the performance of standard prevention. Data analyzed using descriptive analysis and logistic regression. **Results:** The result showed that almost respondents (91.18%) had a good knowledge about prevention standards and 73.5% of respondents had good adherence in performing standard precaution. However, in practice nurses have not been consistent in closing the needles that have been used correctly. The results showed that nurse characteristics did not significantly affect adherence to standard precaution with statistical test results as follows: age ($p = 0.97$), gender ($p = 1.00$), religion ($p = 0.72$), education ($p = 0.85$), work experience at SHW ($p = 0.84$), education training program ($p = 0.71$), knowledge ($p = 0.76$), and needle stick injury ($p = 0.17$). But, there was a significant influence between adherence to standard precaution on the incidence of injury due to puncture needle with p -value = 0.01. **Discussion:** The barriers to applying standard precautions by Myanmar nurses can be reduced by providing basic training, supervision, and improvement of standard operational procedures.

Keywords: Standard Precautions, Knowledge, obedience

INTRODUCTION

Health care worker (HCW) exposures and potential exposures to pathogens are widespread (Karmon, Mehta, Brehm & Dzurenko, 2013 and Henderson, 2012). Globally, in 35 million HCWs, about 3 million receive percutaneous exposures to bloodborne pathogens each year, and that about 40% of HBV and 40% HCV infections and 4.4% of HIV infections in health care workers are attributable to occupational sharps exposures among health care workers (WHO, 2002). Almost all health care workers are at risk for exposure to these pathogens, but among those nurses are the group that is most affected (Yang *et al.*, 2013). It has been estimated that > 50% of nurses will experience at least one needle stick injury in their careers (Rhode & Dupler, 2013).

Compliance with Standard Precautions has been shown to reduce the risk of exposure to blood and body fluids (Parkin, 2012). However, some studies showed that compliance with Standard Precautions among nurses is still sub-optimal and inconsistent (Efstathiou, Papastavrou, Raftopoulos & Merkouris, 2011a; Gebresilassie, Kumei & Yemane, 2014; Punia, Nair & Shetty, 2014; Eljedi & Dalo, 2014; Jackson, Lowton & Griffiths 2014; Takimani 2015; Abu Bakar, Haruna, Teryila, Hamina & Ahmadu, 2015).

In Myanmar, some studies showed that most of the HCWs in Myanmar had high knowledge and positive attitude, but compliance with Universal Precaution / Standard Precaution is inconsistent (Shwe, 2007). It is similar to (Thu, 2012) stated that knowledge of universal precaution had high, only (37.4%) of HCWs (including nurses) had high compliance score at Yangon Orthopedic Hospital and Khine (2007) also found that most of nurses had good knowledge level but only 49.2% of nurses had good adherence to universal precautions in 300 Beds Teaching Hospital, Mandalay, Myanmar.

In Specialist Hospital Waibagi (SHW), results of initial collection data (preliminary study) on 7 to 8 December 2016, it was found that around half of the nurses exposed blood and body fluid of the HIV infectious patients were (40%) and needle stick injury during recapping needle within one year was (12.5%) among nurses. By interviewing one of nurses in SHW regarding compliance with Standard Precautions by phone, her experiences of nurses' compliance with Standard Precautions were inconsistent and major reasons are forgotten to wear gloves and wash hands, available resources storage is a little far from where nursing care is provided, time constraint and emergency situation.

There is very limited previous study analyzing factors affecting on compliance with

Standard Precautions among nurses in Myanmar. The results of this study will be applicable in determining a strategy for improving health behaviors and development of infection control program to prevent occupational exposure to pathogens. Therefore, researcher strike to examine nurses' compliance with Standard Precaution and analyze factors affecting on compliance Standard Precautions.

METHODS

In this study, explanatory research design was used to explain and explore the affecting factors of compliance with Standard Precautions. There are two phases as cross-sectional study to formulate the strategic issues in the first phase of study. The sample size was 34 nurses who are working in SHW except nursing officer (Matron) were recruited and this research was conducted during from March 2016 to April 2016. The dependent variable was compliance with Standard Precautions, while the independent variables were characteristics of nurses, knowledge on Standard Precautions, experienced exposure to blood/body fluids and needle stick injury. The instruments used to measure the level of basic knowledge, and compliance with Standard Precautions by (40) structured questionnaires. The data have been collected and analyzed using a descriptive and logistic regression with a significance level of $p \leq 0.05$.

Ethical Clearance

The study was approved by protection of human rights and welfare in medical research from Ethical Committee of Faculty of Nursing Universitas Airlangga, Surabaya, Indonesia and Department of Health Professional Resource Development and Management, Department of Health, Ministry of Health and Sports Nay Pyi Taw, Myanmar. As this project was a part of a Master thesis, the protocol was reviewed, evaluated and approved by a supervisory committee. The completion of questionnaires was considered as informed consent for participation. The participants were free to participate in or withdraw from the study, anonymities and confidentiality of the participants' information was strictly maintained.

Data Analysis

The statistical package for the social sciences (SPSS) version 23.0 was used to analyze the data. In descriptive statistics, the scoring of knowledge were 10 questions, that each question was rated as 1 mark for the correct response and zero scores for incorrect and no response, and for the score of compliance with Standard Precaution was rated on a Likert's scales (1 = never, 2 = seldom, 3 = sometimes, 4 = often and 5 = always) and conversely in negative statement. The categories for knowledge on compliance with Standard Precautions; low: ≤ 5.5 , enough: 5.5 - 7.5, good: > 7.5 and for compliance with Standard Precautions; Poor: ≤ 90 , Good: > 90 . In inferential statistic, logistic regression was used with a significance level of $p \leq 0.05$.

RESULT

The Content Validity Index (CVI) was determined and all items were ≥ 0.98 , evidence that a CVI of at least 0.80 is considered to be a good criterion for accepting an item as valid (Davis, 1992). Moreover, the Cronbach's alpha was also determined by the response to the all questionnaires by using the Likert-type response format. It was found to be > 0.70 , evidence that the questionnaires had an acceptable level of internal consistency (Bowling, 2009)

Demographic Characteristics of Nurses

Demographic characteristics of 34 participants were age, gender, religion, nursing education, working experiences at SHW, education training. The mean age of participants ranged from 22 to 57 years and majority of participants (50%) were in 26-35 years age group. In gender group, almost all (97.1%) participants were females and only one was male. Most of participants (85.3%) were Buddhist and remaining participants (14.7%) were Christian. More than two third (67.6%) of them were bachelor holder and one third had diploma degree. Total service of participants ranged from less than one year to 19 years and two third of participants had 5 to 10 years of service in SHW. The duration of employing in SHW, only (20.6%) attended educational training for Infection Control in local and international.

Table 1. Level of Knowledge on Standard Precautions

No	Knowledge	Total frequency	Percentage (%)
1	High	32	94.11
2	Average	2	5.89
3	Low	-	-
	Total	34	100

Table 2. Experienced exposures to blood/body fluids and Needlestick Injury among nurses in SHW

No	Structural variables	Category		Total F(%)
		Yes F(%)	No F(%)	
1	Exposure to Blood or body fluids	15 (44.12)	19 (55.88)	34 (100)
2	Experienced Needle Stick Injury	5 (14.71)	29 (85.29)	34 (100)

Table 3. Overall Compliance and Specific Compliance with Hand Washing, Gloving, Wearing Mask, Eye Wearing, Safety Sharp Handling

No	Compliance with SP	Good F (%)	Poor F (%)	Total F (%)
1	Overall Compliance	25 (73.5)	9 (26.5)	34 (100)
2.	Hand Washing	34 (100)	0 (0)	34 (100)
3.	Gloving	34 (100)	0 (0)	34 (100)
4	Wearing Mask	31 (91.2)	3 (8.8)	34 (100)
5	Eye Wearing	0 (0)	34 (100)	34 (100)
6	Safety Sharp handling	28 (82.4)	6 (17.6)	34 (100)

Compliance on Standard Precautions

The overall compliance on Standard Precautions, analysis data showed that (73.5%) of participants had good and (26.5%) participants were poor compliance with standard precautions practice in this study. Specifically, all participants had good practice for hand washing and gloving as (100%) participants reported as good compliance in each. Contrary, practice of eye wearing was very poor since (100%) participants described poor practice and no participant always used eye shield. In wearing mask and following safety measure for sharp handling practice, only (8.8%) and (17.6%) responded positively indicating poor compliance (Table 3).

Major Reasons of Non-Compliance with Standard Precautions

Most reasons of non-compliance with Standard Precaution in this study are emergency situation, workload, recapping needle, unusual wearing eye shields, forget to wear glove and wash hands, uncomfortable to

use PPE and poor fit, availability of resources storage is a little far from where nursing care is provided, and time constraints. Therefore, affecting factors on compliance with Standard Precautions would be explored to improve nursing staff's compliance with Standard Precaution.

The Effects of Characteristics of Nurses, Exposure to Blood/BodyFluid, Needle Stick Injury and Knowledge on Compliance with Standard Precautions

Statistical test results using logistic regression showed significant value in exposure to blood/body fluids $p = 0.01$, characteristics of nurses such as age $p = 0.97$, gender $p = 1.0$, religion $p = 0.72$, nursing education $p = 0.60$, working experience $p = 0.84$, and educational training program $p = 0.71$, knowledge on standard precaution $p = 0.76$, and needle stick injury $p = 0.17$, did not significant effect on compliance with Standard Precautions (Table 4).

Table 4 The Effects of variables on Compliance with Standard Precautions

Variables	B	S.E	Wald	df	Sig.	95% CI for Odds ratio
Age	.10	1.723	.000	1	0.97	1.01
Gender (male/female)	-19.91	40192.99	.000	1	1.00	.000
Religion	.530	1.453	.133	1	0.72	1.70
Education	.625	1.202	.271	1	0.60	.535
Service at SHW			.816	3	0.84	
Training (Yes/No)	-.626	1.698	.136	1	0.71	.535
Exposure (Yes/No)	2.559	.993	6.642	1	.010	12.929
Needle Stick Injury (Yes/No)	.747	1.299	1.808	1	.179	.174
Knowledge (good/average)	-.474	1.557	.093	1	.761	.622

DISCUSSION

In this study, regarding overall compliance with Standard Precautions, almost three-quarters (73.5%) of participants were good compliance among Myanmar nurses in SHW. In Myanmar, this result which compare favorably with other studies that reported (62.6%) of nurses had good compliance among 92 participants in Yangon Orthopedic Hospital (Thu, 2012) and (49.2%) of Myanmar nurses were found good compliance in Mandalay, 300 beds teaching hospital (Khine, 2007). International studies that reported (59.4%) nurses presented high mean score of adherence to Standard Precautions in a University hospital from Brazil (Toffanet *et al.*, 2011), HCWs (including nurses) had good compliance in Ethiopia (42.9%) (Gebresilassie *et al.*, 2014) In contrast, it is still lower than the rate of compliance reported among 32 Hospital nurses in Cyprus (100%)(Efstathiou *et al.*, 2011b) 120 nurses in Iran was discovered Standard Precautions (97.5%) and among 1444 clinical nurses from 18 hospitals in Hunan, China (95%) (Luo, He & Zhou., 2010).

Specifically, with regarding hand washing, all participants (100%) self-reported as good compliance with hand washing, and only (5.88%) participants self-reported that they seldom wash their hands before and after giving care to the patient. These findings are strongly approved the statement that hand washing always should be carried out before and after the provisions of care as it reduces the count of microorganisms on one's hands, protecting both healthcare professionals and patients from the spread of infection

(Apostolopoulou, Raftopoulos, Terzis, Pissaki & Pagoni, 2010).

Regarding gloving in practice, it also was good compliance with gloving (100%) in this study. While drawing patient's blood (81.2%) participants always and only (8.8%) sometimes wear gloves. It is not similar findings as one-third of participants reported that they did not always wear gloves when exposure was likely to happen (e.g. during the drawing of blood) among Cypriot nurses (Efstathiou *et al.*, 2011a). However, it is consistent that use of gloves appeared while drawing the blood (81.0%) and during instances when coming on contact with mucous membranes or non-intact skin of the patients (88.3%) (Punia *et al.* 2014)

Contrary, the practice of eye wearing was very poor since all participants described compliance with eye wearing as poor compliance and no participant always used eye shield during nursing caring procedure that may lead to the splashing of blood and body fluids. Similarly, Takimani (2015) found that only (5.6%) of participants use eye protection and the most neglected personal protective equipment in high-risk procedure is eyewear among nurses in Nairobi. Punia *et al.* (2014) also mentioned that only (22.2%) of participants always wear eye protection in an emergency and Trauma Triage Centre from South India. It is not follow the infection control manual, 2014 that protective eyewear must be worn while performing any procedure where there is a likelihood of splashing or splattering of blood or other body substances (Infection control manual, 2014). This practice leads to the greatest hazard of possibility of splash or splatter to nurses' eyes that can be more rising occupational exposure.

In concerning wearing mask, most of participants reported satisfactory as (91.2%) good practice. They may be belief that face mask can prevent the inhalation of air-transmitted micro-organisms and they are highly recommended when the exposure to such microorganisms is anticipated (Siegel & Rhinehart, 2007).

Safety sharp handling practice also was (82.4%) good compliance among nurses in this study. When at work nurses always dispose of all potentially contaminated materials into a red (and/or labeled) bag for disposal as biomedical waste and they always discard the sharp objects to puncture resistant sharps containers were (73.5%). Similarly, the majority (95.7%) of participants answered that nurses always discarded used sharp objects into a sharps container among Cypriot nurses (Efstathiou *et al.*, 2011a). This behavior is in accordance with the requirements of Standard Precautions, which requires that, to prevent poses a danger of injury for the safety of all healthcare workers. However, Punia *et al.* (2014) stated that improper disposal of sharps among the healthcare workforce in a trauma care setting in South India.

A used needle poses a serious danger of needle stick injury (Schmid, Schwager & Drexler, 2007). Used needles never should be recapped, as this could lead to a needles-stick. Statistical test results using logistic regression showed significant value in exposure to blood/body fluids $p = 0.01$, ($p \leq 0.05$). Unfortunately, two third of participants self-reported that nurses always recapped needles before discarding it in this study. This finding agreed with other studies in Myanmar, it was surprising to find that significantly large proportion of respondents (94.9%) recapped the needle after use (Shwe, 2007) and (89%) recapped and more than half of respondents had experience of needle stick injury (Thu, 2012).

Some studies of other countries, Punia *et al.* (2014) stated that inadequate needle safety precautions among the healthcare workforce in a trauma care setting in South India. Before they discarded it, (43.7%) of the respondents did not always avoid recapping a used needle among Cypriot nurses (Efstathiou *et al.*, 2011a) and (Reda *et al.*, 2010) also showed that needle recapping (46.9%) of healthcare worker (including nurses) in Ethiopia.

Contrary, the practice of recapping used needles was uncommon, (94.4%) of the participants disposed of the syringe and needle immediately into puncture resistant containers without recapping among nurses in Nairobi (Takimani, 2015). (Abubakar *et al.*, 2015) also found that among nurses working at Federal Medical Centre Gumbo, Nigeria, majority (76.25%) of the respondents do not recap needle after use and most respondents (80%) dispose used syringes and needles in the safety box.

In this study, the practice of recapping needle was not satisfactory. It is a very dangerous situation for them. Used needles never should be recapped, as this could lead to a needles-stick injury. Consequently, it is cautions that recapping a used needle poses a high risk of needlestick injury among nurses in SHW.

The Effects of Characteristics of Nurses on Compliance with SPs

This current study reported that there was no significant effect between compliance with standard precautions and characteristics of nurses as age, gender, religion, year of experiences, nursing education and education training. Osborne (2003) in Australia, Demir (2009) and Hosoglu *et al.*, (2011) in Turkey found that there was relationship between the low compliance rate and the participant's demographic characteristics as age, gender and religion. This is consistent with Ayed, Equait, Fashafsheh and ali (2015) study in Palestine and Fashafaheh *et al.*, study in Egypt (2015) according to age, gender, years of experiences, nursing education, education training but inconsistent with Ayed *et al.* (2015), Efstathiou *et al.*, study (2011a) and (Mortada & Zalat 2013), study (2014) according to gender. Moreover, inconsistently, Abubakar *et al.* (2015) study in Nigeria and Efstathiou *et al.*, (2011a) study in Cyprus showed that the longer years of experiences of the nurses working, the more frequently they would follow Standard Precautions.

In addition, Efstathiou *et al.*, (2011a) showed that educational programs can influence nurses' compliance level and persuade them to use Standard Precautions more frequently. According to Luo, *et al.*, (2010), the education and health promotion needed to make nurses comply with SPs are

constant trainings and provisions of continuous seminars especially if these trainings become a compulsory requirement to nursing staff in hospitals.

CDC (2013) also asserted that education on the basic principles and practices for preventing the spread of infections should be provided to all health care professionals. Further, the CDC (2014) stressed that education and training should be conducted on a regular basis (e.g., annually) to maintain competency. In this study, only less than one-fifth of participants received educational training about infection control workshop. It is very small amount education program for nurses in SHW who are caring the patients with HIV and AIDS with opportunistic infections as Tuberculosis, Hepatitis B, Hepatitis C and other contagious diseases.

Concerning Effect of Knowledge, Exposure and Needle Stick Injury

Almost all (91.18%) of the participants were found to be have high level of knowledge and this satisfactory knowledge was found to be higher than what reported in studies by (Thu 2012) in Myanmar that (68 %) of participants were reported overall high knowledge of Standard Precautions, (Ayed *et al.*, 2015) in Palestine that about three quarters (76%) of the respondents were found to have good and fair knowledge of Standard Precautions and (Abu Bakar, *et al.*, 2015) in Nigeria that (28.75%) of the participants have good knowledge of the components of Standard Precautions.

This study was also reported that knowledge on compliance with Standard Precautions and needle stick injury were not statistically significant effect on compliance with standard precautions. Contrary, different studies have indicated that high level of knowledge of SPs was a significant predictor of better compliance with SPs practices (Hinkin & Cutter, 2014); Mitchell, Say, Wells Wilson, Cloete and Matheson (2014). Knowledge and training influence were the predictors for nursing students' compliance with Standard Precautions among nursing students in China (Cheung *et al.*, 2015). Moreover, it should be the nurse who experienced needle stick injuries, the fear to infect the lethal infection and the more frequently willing to follow the precautions and more caring to protect their life from

hospital infections. It is urgently needed to improve nurses' behavior that is at high risk of getting exposed to blood-borne infections (HIV, HBV and HCV).

The results of parameter estimations indicated that there is statistically significant effect of exposure to blood/body fluids on compliance with Standard Precautions ($p = 0.01$, $p \leq 0.1$). Inconsistently, Efstathiou *et al.* (2011) and (Mortada & Zalata, 2014) also stated that their study detected a high level of self-reported exposure to blood and body fluids that was significantly different among noncompliant compared with compliant participants. In agreement with another study among HCW in Ethiopia, Reda *et al.* (2010) the regression model indicated that HCWs who regularly apply Standard Precautions reduced their exposure incidents by 20%.

In this study, there were almost half of nurses in SHW had exposure to blood/body fluids. Even though nurses had exposed to infected blood/body fluids, nurses still attributed risk perceptions. Nurses did not always use PPE and focus on work accomplishment rather than their safety for themselves.

CONCLUSION

The results of this study showed that nearly all respondents had a good knowledge of the standards for the prevention and Majority of respondents have good adherence to standard precautions, but the prevention of injuries from the needle puncture can't be implemented to the maximum among Myanmar nurses in SHW. The characteristics of nurses such as age, gender, religion, nursing education, working experiences and educational training program, knowledge on standard precaution and needle stick injury were not significant effect on compliance with standard precautions. Nurses who have experience exposed needle prick when performing nursing actions provide significant results on the level of compliance

Nurses always should be alert for infections, prohibited to recapping used needles, anticipated all personal protective equipment and needed to learn continuous education and advanced knowledge.

Nurse managers and senior nursing officers should need to continuous reminding to follow compliance with Standard

Precautions and updated information in CNE (Continuing medical/nursing education) about infection control and get feedback from the all nurses in every month.

Health authorities should provide adequate human and material resources, mandatory seminar/ workshop and internal and external motivation for quality health care, safety occupational environment and reducing identified Standard Precaution barriers Assessment of exposure, and checkup for all HCWs needed to be introduced in SHW.

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