

IMPROVING COMPLIANCE WITH STANDARD PRECAUTIONS AMONG MYANMAR NURSES USING HEALTH BELIEF MODEL

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ABSTRACT

Introduction: Healthcare workers are at risk of widespread exposure to pathogens. But among those nurses are the most affected. Relevant literature reports that, compliance with Standard Precaution (a set of guidelines that can be reduced the risk of exposure to pathogens) is inconsistent among nurses. The objective of this study was to improve compliance with Standard Precautions among Myanmar nurses in Specialist Hospital Waibagi (SHW), Myanmar using Health Belief Model (HBM).

Method: A cross-sectional study design and focus group discussions were used to gather in-depth information directly. Thirty-four nurses out of 35 nurses from SHW were involved in this study. They helped to elicit nurses' perception on improving compliance with Standard Precaution. Health Belief Model was used as the theoretical framework and the data were analyzed according to predetermined criteria.

Result: The results revealed that although almost three fourth (73.5%) of participants had good compliance eye wearing and recapping needle practices were needed to be improved. The study showed that perceived Susceptibility ($p = 0.04$), perceived benefits ($p = 0.03$), perceived barriers ($p = 0.04$) was significant. But perceived seriousness on compliance with Standard Precaution ($p = 0.14$) with p value ≤ 0.05 was not significant.

Conclusion: Provision of regular nursing education, both in the form of human and material resources in quality and quantity, and reducing identified barriers would improve compliance with Standard Precaution.

Keywords : *Compliance, Personal Protective Equipment for Nurses, Health Belief Model*

INTRODUCTION

Healthcare workers (HCWs) are at risk for exposure to pathogens, but among those nurses are the group that is most affected (Ortiz *et al.*, 2013; Yang *et al.*, 2013). It has been estimated that > 50% of nurses will experience at least one needlestick injury in their careers (Rhode, Dupler & Posta, 2013). Compliance with Standard Precaution has been shown to reduce the risk of exposure to blood and body fluids (Parkin, 2012).

Compliance with Standard Precaution

The practice of Standard Precaution is widely promoted to protect HCWs from exposure to healthcare associated infections (Gebresilassie, Kumei & Yemane,

2014). However, some studies showed that compliance with Standard Precaution among nurses is still sub-optimal and inconsistent (Efstathiou *et al.*, 2011a; Gebresilassie *et al.*, 2014; Punia *et al.*, 2014; Eljedi & Dalo, 2014; Abubakar *et al.*, 2015).

In Myanmar, despite implementing compliance with standard precaution, there is still inconsistency in compliance with standard precautions. Several studies showed that most of Myanmar HCWs' compliance with Universal/ Standard Precaution is inconsistent (Shwe, 2007) Moreover, only (37.4%) of HCWs (including nurses) had high compliance score at Yangon Orthopedic Hospital (Thu, 2012). Khine (2007) also

found that only 49.2% of nurses had good adherence to Universal Precautions in 300 Beds Teaching Hospital, Mandalay, Myanmar.

Health Belief Model

To explain and understand the factors that effect an individual's compliance, which may consequently contribute towards the adoption of certain behavior? some guidelines was developed under the same condition, by following or not following certain guidelines. The most commonly used model is the Health Belief Model (Hazavehei, Taghisi & Saidi 2007, Kartal *et al.*, 2007). It is based on two axes: a) the perceived threat for acquiring a disease, which incorporates the perceived susceptibility and perceived seriousness, constructs and b) the enabling factors that trigger the behaviour, which include the perceived benefits and perceived barriers. This has also been previously tested and found as an appropriate theoretical model to use for measuring attitudes of nurses and health care workers towards implementing certain aspects of universal precautions from occupational exposure to pathogens (Efstathiou *et al.*, 2011b).

Aim of the study

This study aimed to explain the predictors of compliance with Standard Precautions and recommend improvement in compliance with Standard Precaution among nurses in SHW.

METHODS

In this study, explanatory research design was used to explain and explore the predictors of compliance with Standard Precautions. There are two phases; (1) Cross sectional study to formulate the strategic issues in the first phase of study and (2) Focus group discussions were used to gather in-depth information directly based on strategic issues. The sample size was 34 nurses out of 35 nurses working in SHW except nursing officer (Matron), using purposive sampling method. The study was conducted during from March to April 2016. The dependent variable was compliance with Standard Precautions and the independent variable were perceived susceptibility, perceived seriousness, perceived benefits and perceived barriers. The instruments used were (62) structured questionnaires. The data were collected and analyzed using a descriptive and logistic regression with a significance level of $p \leq 0.05$.

ETHICAL CONSIDERATIONS

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. The completion of questionnaires and focus group discussions were considered as informed consent for participation. The participants were free to participate or to 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 scores of perceived susceptibility, seriousness, benefits and barriers were rated on a Likert's scales (1 = Strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) and conversely in negative statements and 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). The categories for compliance with Standard Precaution; Poor: ≤ 90 , Good: >90 and for perceived susceptibility, perceived seriousness, perceived benefits and perceived barriers; low: ≤ 22 , enough: 22-30, good: >30 . In inferential statistic, logistic regression was used with a significance level of $p \leq 0.05$.

RESULTS

The Cronbach's alpha was also determined from the response to the all questionnaires by using the Likert-type response format. It was found to be >0.70 . This revealed that the questionnaires had an acceptable level of internal consistency (Bowling, 2009). The Content Validity Index (CVI) was also determined and all items were ≥ 0.98 . This proved that a CVI of at least 0.80 is considered to be a good criterion for accepting an item as valid (Davis, 1992). Moreover, construct validity test using correlation technique Pearson's product moment by comparing the count r in the table was also done. The r value in this study was 0.3783 (significance level of 5%) with $N = 20$.

Demographic Characteristics of Nurses:

Among 34 participants, the mean age of participants ranged from 22 to 57 years and majority of participants

17 (50%) were in 26-35 years age group. In gender group, almost all (97.1%) participants were females and only one was male. Only (20.6%) attended educational training for Infection Control in local and international level. The history of exposure showed that almost half 15(44.12%) was exposed to blood/body fluid splashing into eye, mouth and 5(14.71%) experienced needle stick injury during patient care.

Table 1: Level of Perceptions of Infections and Compliance with Standard Precautions

No.	Health Belief Model variables	Category			Total F(%)
		Good F(%)	Average F(%)	Low F(%)	
1.	Perceived Susceptibility	17 (50)	17(50)	0(0)	34(100)
2.	Perceived Seriousness	14(41.18)	19(55.88)	1 (2.94)	34(100)
3.	Perceived Benefits	18(52.94)	16(47.06)	0(0)	34(100)
4.	Perceived Barriers	6(17.6)	21(61.82)	7(20.58)	34(100)

Perceived Susceptibility, Seriousness, Benefits and Barriers

In table 1, regarding perceived susceptibility, half of the participants 17 (50%) had good response, another half had average and no one had poor category. Regarding perceived seriousness, participants were good and average categories ranging between 14 (41.18%) and 19 (55.88%) respectively, and only 1(2.94%) participant had poor response. More than half 18 (52.94 %) of participants had good perception of benefits regarding Standard Precaution and 16 (47.06%) had average perception. No participant perceived that Standard Precautions are not benefit for nurses. With regards to perceived barriers, 21(61.82%) participants had average perception on barriers of Standard Precautions, 6 (17.6 %) had good level of perception and 7 (20.58%) participants had low perception barriers on Standard Precautions.

Table 2: 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 with Standard Precautions

In table 2, data analysis showed that overall compliance with Standard Precaution that is 25 (73.5%) of participants had good and 9 (26.5%) participants were poor compliance with Standard Precautions practice. Specifically, all participants (100%) reported as good compliance for hand washing and gloving. Contrary to this, practice of eye wearing had poor compliance since all the participants (100%) described poor practice. In wearing mask and following safety measures for handling sharp appliances, only 3 (8.8%) and 6 (17.6%) responded positively indicating poor compliances.

Table 3: Logistic Regression Predicting Likelihood of Reporting compliance with Standard Precautions by HBM variables

Indicators	B	S.E.	Wald	df	Significance	95% CI for Odds ratio
Perceived Susceptibility (Good/average)	0.438	1.227	3.94	1	0.047	11.449
Perceived Seriousness (Good/Low)	-	-	3.93	2	0.140	-
Perceived Benefits (Good/Low)	2.68	1.285	4.36	1	0.037	14.625
Perceived Barriers (Good/low)	- 18.81	15191.52	6.191	2	0.045	0 .000

The Effects of Perceived Susceptibility, Seriousness, Benefits and Barriers on Compliance with Standard Precautions

To examine the possible effect of perceived susceptibility, seriousness, benefits and barriers on compliance with Standard Precautions using logistic regression showed that it was statistically significant with regard to perceived susceptibility ($p = 0.04, p \leq 0.05$), perceived benefits ($p = 0.03, p \leq 0.05$) and perceived barriers ($p = 0.04, p \leq 0.05$) and perceived seriousness did not significantly effect on compliance with Standard Precautions ($p = 0.14, p \geq 0.05$) (Table 3).

DISCUSSION

This is the first study of its kind to recommend improvement in compliance with Standard Precautions among Myanmar nurses in SHW using HBM. In this study, regarding overall compliance with Standard Precautions, almost three-quarters (73.5%) of participants had good compliance among Myanmar nurses in SHW.

Other studies showed similar results where 62.6% of nurses had good compliance among 92 participants in Yangon Orthopedic Hospital (Thu, 2012) and

49.2% of Myanmar nurses portrayed good compliance in Mandalay teaching hospital (Khine, 2007). Other international studies reported that 59.4% nurses presented high mean score of adherence to Standard Precautions in a University hospital from Brazil (Toffano *et al.*, 2011). HCWs (including nurses) also 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%) (Esftathiou *et al.*, 2011b), 120 nurses in Iran (97.5%) and among 1444 clinical nurses from 18 hospitals in Hunan, China (95%) (Luo *et al.*, 2010).

Specifically, the practice of hand washing and gloving also was good (100%) in this study. With respect to wearing mask, most of participants (91.2%) reported satisfactory good practice. Moreover, following safety measures while handling sharp appliances showed good compliance among nurses in this study (82.4%). This indicated that nurses in SHW were highly careful regarding the exposure to microorganisms to prevent contamination (Siegel *et al.*, 2007). This behavior is in accordance with the requirements of Standard Precautions to prevent danger of injury for the safety of all HCWs.

Contrary to this all participants described poor compliance with respect to eye wearing and none of the participant wore eye shield during nursing care procedure. This may lead to the splashing of blood and body fluids. They did not follow the infection control manual. In 2014, it was stipulated 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 (CDC, 2014). Similarly, Moyo (2015) found that among nurses in Nairobi only 5.6% of participants used eye protection and the most of them neglected personal protective equipment in high risk procedure.

A used needle poses a serious danger of needle stick injury (Schmid, Schwager & Drexler, 2007). Used needles should never be recapped, as this could lead to a needles-stick injury (Efstathiou *et al.*, 2011a). Unfortunately, two third of participants self-reported that they always recapped needles before discarding it. 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). More than half of respondents (89%) had experience needle stick injury (Thu, 2012).

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

Contrary, the practice of recapping of used needles was uncommon, 94.4% of the participants disposed off the syringe and needle immediately after use into resistant containers without recapping among nurses in Nairobi (Mayo, 2015). Abubakar *et al.* (2015) also found that 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 among nurses working at Federal Medical Centre Gumbo, Nigeria.

In this study, the recapping needle and eye wearing were not practiced satisfactorily. Used needles should not be recapped, as this could lead to a needles-stick injury and not wearing eye protection also leads to the greatest hazard of possibility of splash or splatter to nurses' eyes that can lead to more occupational hazards.

Effect of Perception of Susceptibility of Infections

The results of parameter estimations indicated that perceived susceptibility of infections had significant effect on compliance with Standard Precautions ($p = 0.04, \leq 0.05$). Similarly, health belief model variable subscale as perceived susceptibility had statistically significant relationship with the compliance with Standard Precautions (Mortada & Zalut, 2014; Efstathiou *et al.*, 2011). Contrary, Cheung *et al.*, (2015) stated that perceived susceptibility was not statistically significant in relationship with the compliance with Standard Precautions.

In this study, nurses pointed out they have perceived that their working area is an environment full of infective organism transmitting infections from patients and vice versa. However, some nurses neglect

this situation because they were working in this area for long times and all activities are routinely done and they think that giving nursing care without using Personal Protective Equipment (PPE) may not lead to the acquisition of diseases like HIV, HCV, HBV and other contagious infections. Therefore the nurses must be informed and knowledgeable appropriately to get a better perception regarding PPE. This will reduce the existing negative attitude toward the implementation of Standard Precautions.

Effect of Perceived Seriousness of Infections

Perceived seriousness on infection of participants were in moderate and low level in the present study. The results of parameter estimations indicated that perceived seriousness of infections had no significant effect on compliance with Standard Precautions logistic regression ($p=1.00$, $p>0.05$). Similarly, Power *et al.*, (2016) and Cheung *et al.*, (2015) stated that perceived seriousness was not statistically significant with respect to compliance with Standard Precautions. Contrary, perceived seriousness was statistically significant in relationship with the compliance with Standard Precautions in many other studies (Mortada & Zalat, 2014; Efstathiou *et al.*, 2011; Osborne, 2003).

In this study, it is evident that although nurses had awareness that HIV, HCV, HBV and other contagious diseases are serious, but some participants did not consider that it is dangerous for them. Therefore, more attention should be given to compliance with Standard Precautions among nurses.

Effect of Perceived Benefits on Compliance with Standard Precautions

The results of parameter estimations indicated that perceived benefits of prevention of infections had significant effect on compliance with Standard Precautions by using logistic regression ($p = 0.03$, ≤ 0.05). Similarly, perceived benefit was statistically significant in relationship with the compliance with Standard Precautions in other studies (Mortada & Zalat, 2014; Efstathiou *et al.*, 2011; Osborne, 2003). Contrary, Power *et al.* (2016) and Cheung *et al.*, (2015) stated that perceived benefits of Standard Precautions was not statistically significant in relationship with the compliance with Standard Precautions.

In this study, almost all the participants had good perception of benefits on Standard Precautions. The participants with average level of perceived benefits should improve their compliance for the staff nurse in SHW. However, some nurses expressed their opinions that they were recapping used needles because they thought that it can lead to injury to other. Therefore the nurses perceived benefits on Standard Precautions but work according to the situation.

Effect of Perceived Barriers on Compliance with Standard Precautions

Among all participants, about two-third of participants had average perception on barriers of Standard Precautions. The results of parameter estimations indicated that perceived barriers of infections had significant effect on compliance with Standard Precaution by using logistic regression ($p = 0.04$, ≤ 0.05).

This was supported by other studies where there was statistically significant relationship with the compliance with Standard Precaution (Efstathiou *et al.*, 2011b; Power *et al.*, 2016; Osborne, 2003; Cheung *et al.*, 2015). But in the study by Mortada & Zalat, (2014) it was stated that perceived barriers was not statistically significant in relationship with the compliance with Standard Precautions.

In this study, some participant perceived that interference with his/her undertaking to continue the self-protective behaviour in compliance with Standard Precaution. The common reasons of non compliance with Standard Precaution in this study are emergency situation, workload, forget to wear glove due to washing of hands, uncomfortable to use PPE and poor fit, availability of these resources storage being far from where nursing care is provided and time constraints. Therefore, reducing identified Standard Precautions barriers must be practiced by nursing staff for increasing compliance with Standard Precaution.

The Factors that Affect the Practice of Standard Precautions

On the factors influencing the practice of Standard Precaution, inadequate nursing personnel and inappropriate supply of infection prevention materials, increase work load, and emergency

situations were reported from focus group discussions. These findings tally with that of Efstathiou *et al.* (2011) whose report on factors influencing nurses compliance with Standard Precaution in Cyprus, revealed that emergency situation, lack of equipment, shortage of nursing personnel and working experience are major obstacle to practice of Standard Precaution.

Improving Nurses' Compliance with Standard Precaution (SP) Based on Focus Group Discussions

- i) Sharing the results of nurses' perception of compliance and strategic issues for improving nurses' compliance with SP.
- ii) Providing continuous nursing education (CNE) about infection control and open group discussion
- iii) Providing posters for hand hygiene steps, including five steps of hands washing, guideline of hands washing and Standard Precaution in every unit in SHW.
- iv) Distributing hand gel (antiseptic gel) to all units in SHW.
- v) Planning with nursing officer and head of nurses to provide adequate and comfortable eye wearing and the provision of adequate safety boxes along with reward and punishment program.

LIMITATION

There are some limitations that dictate caution in the interpretation of the results of this outcome data.

- i) This study consisted of small sample size which is strongly and completely representative for all nurses in SHW only, it cannot be generalized to all hospital settings.
- ii) This is a cross-sectional study, the limitations that come with this type of design is that while collecting data there is a possibility of biasness in data collection. This need to be taken into consideration

- iii) The use of a self-completed questionnaire might have been associated with self-reported bias leading to lack of direct observation to compliance in the first phase of study.

CONCLUSION

In this study, there was inconsistency in some aspects of compliance with Standard Precautions among Myanmar nurses in SHW. Among Health Belief Model variables, perceived susceptibility, benefits and perceived barriers were statistically significant with relation to compliance with Standard Precautions except perceived seriousness. Nurses will take into consideration the unsafe practices they are involved in their everyday lives and start to change their mode of actions into effective proper practices. Post results also showed better outcomes in the behavior of the nurses. Therefore, the results of this study will be applicable as a strategy in improving compliance with Standard Precautions to prevent occupational exposure to pathogens among nurses, patients and other high-risk groups.

RECOMMENDATION

- i) Nurses should be alert regarding practice of Standard Precaution to prevent infections and use all personal protective equipment. They also need to learn continuous education and acquire advanced knowledge.
- ii) Nurse managers and senior nursing officers need to continuous remind (strict supervision) to follow compliance with Standard Precautions and should continuously organize mandatory seminars/ workshops on Standard Precaution to increase awareness and practice and get feedback from all nurses.
- iii) Health authorities should develop specific policies/operational guidelines on the practice of Standard Precaution and should ensure regular provision of adequate human and material resources, and internal and external motivation for quality health care and safety occupational environment. Disciplinary measures should be formulated for poor compliance to enhance practices.

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