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Major article

Predictors for compliance of standard precautions among nursing students



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Key Words:

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Interaction effects

Background: We aimed to investigate the frequency of standard precautions (SPs) compliance and the factors affecting the compliance among nursing students (NSs).

Methods: A cross-sectional survey study guided by the health belief model was conducted in 2009. The study questionnaire is valid (content validity index, 0.81) and reliable (Cronbach α range, 0.65–0.94).

Results: There were 678 questionnaires analyzed, with a response rate of 68.9%. The mean frequency score of SPs compliance was 4.38 ± 0.40 out of 5. Tukey honest significant difference post hoc test indicated that year 2 and year 4 students had better SPs compliance than year 3 students. Further analysis using a univariate general linear model identified an interaction effect of perceived influence of nursing staff and year of study ($F_{1,593} = 3.72; P < .05$). The 5 following predictors for SPs compliance were identified: knowledge of SPs, perceived barriers, adequacy of training, management support, and influence of nursing staff.

Conclusion: Although the SPs compliance among NSs was high, the compliance varied by year of study and was affected by the nursing staff. Furthermore, SPs compliance among NSs can be enhanced by increasing SPs knowledge, providing more SPs training, promoting management support, reducing identified SPs barriers, and improving nursing staff compliance to SPs.

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Nursing students (NSs) are at high risk of exposure to occupational biologic hazards because they are obligated to provide care to patients admitted with an unknown infection status.¹ Owing to the nature of the work, health care workers (HCWs) are 3 times and 5 times more likely to acquire tuberculosis² and hepatitis B (HB),³ respectively, than the general population. Thirty-seven percent of HB and 10% of AIDS among HCWs are the result of occupational exposure.⁴ In 2003, within 8 months of the outbreak of severe acute respiratory syndrome, it had spread rapidly to 30 countries, 8,096

people were infected, and 774 died from severe acute respiratory syndrome.⁵ Among those infected, 21% ($n = 1,706$) were HCWs.⁵ In the last 10 years, the reported cases of avian and swine influenza around the world, and lately the novel coronavirus in the United Kingdom (UK)⁶ and avian influenza A,⁷ signify the possibility of virus mutation and person-to-person transmission. These uncertainties on infectious diseases continue to pose a threat to the health of HCWs.⁶

Although HCWs face the challenge of emerging infectious diseases and pandemics, standard precautions (SPs) have been proven by evidence-based research as “the foundation for prevention transmission of infectious agents in all healthcare settings.”⁸ Hence, HCWs are required to treat patients as potentially infectious⁹ and apply SPs routinely.¹ However, HCWs adopt SPs depending on their

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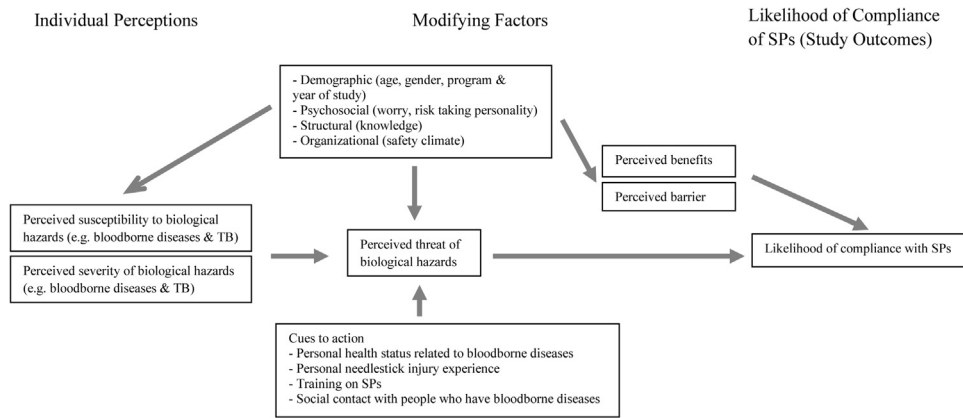


Fig 1. Conceptual framework to guide the study. SP, standard precautions; TB, tuberculosis.

own perception of risk of contracting the infectious disease in each clinical situation.¹⁰ The compliance of SPs among HCWs is exceptionally low. For nurses, the compliance of SPs ranged from 9.1%–73%.^{9,11} Factors affecting SPs compliance among registered nurses included individual factors (eg, age,¹² sex,¹³ knowledge¹⁴), psychosocial factors (eg, risk-taking personality,¹⁵ perceived susceptibility¹⁶), and organizational factors (eg, safety climate).¹⁷ Still, limited studies have been conducted to investigate the compliance of and factors affecting SPs among NSs.¹⁸ Worldwide, NSs in pre-registration programs are required to provide nursing care in clinical practice.¹⁹ In addition, their knowledge acquired and compliance of SPs during their nursing training years might affect their practice as they become registered nurses. A review of the literature found that only 2 studies, conducted in Italy and Brazil, have examined the compliance of some aspects of SPs in NSs^{18,20}; and 4 studies examined knowledge of infection control preventive measures among NSs in France, Italy, Taiwan, and the United States.^{20–23} However, no investigations to our knowledge have been carried out on the factors affecting the compliance of SPs among NSs. Theoretical frameworks have been used to guide studies on SPs among registered nurses,^{12,24} but not in NSs. Furthermore, the sample size of those studies conducted among NSs was relatively small, ranging from 48–175 participants in 1 particular year of study.^{18,20,21,23} It remains unclear whether NSs' compliance of SPs would be affected by registered nurses in the clinical settings.¹⁸ Therefore, the aim of this study was to investigate the factors affecting the compliance of SPs among NSs.

METHODS

Design

This was a cross-sectional survey study. NSs who were studying in a full-time undergraduate program in 1 university in Hong Kong were invited to participate in the study. Ethical approval from the university was obtained.

Conceptual framework

The health belief model (HBM) is one of the most widely used models to explain and predict why an individual does or does not take preventive health measures.^{25,26} The 3 key components are individual perceptions, modifying factors, and factors affecting the likelihood of taking preventive health measures.²⁶ Furthermore, the individual perception component has the 2 following dimensions: perceived susceptibility (eg, NSs' own subjective perception of the

risk of contracting bloodborne diseases) and perceived severity (eg, NSs' own subjective perception of the consequential seriousness of contracting bloodborne diseases).²⁵ The combination of these 2 dimensions contributes to the perceived threat for acquiring bloodborne diseases.²⁴ The perceived threat provides the motivation to act.²⁵ The other key component, modifying factors, consists of demographic, sociopsychologic, structural, and cues to action factors, which influence NSs to take preventive measures.²⁶ The third component, the likelihood of taking preventive measures, also has 2 dimensions, which are perceived benefits (eg, NSs believe that SPs can effectively prevent them from contracting bloodborne diseases) and perceived barriers (eg, NSs believe that there are possible hindrances to engaging SPs).²⁶ If the perceived benefits are greater than the perceived barriers, it is more likely that the NSs would comply with the SPs or vice versa (Fig 1).²⁵

Instrument

A questionnaire was developed based on a review of the literature.^{15–17,27–30} Its content validity was evaluated by 4 experts in the field of nursing and infection control, with an acceptable content validity index of 0.81.³¹ The 2-week test and retest reliability was conducted among 10 NSs, with an acceptable reliability of 0.99. Based on the study data (N = 678), Cronbach α of subscales were acceptable, ranging from 0.65–0.94.

The questionnaire consists of demographic information (eg, age, sex, program, year of study) and experience of needlestick injury and source of SPs information. The rest of the questionnaire has 12 subscales of which most are measured by a 4-point Likert scale (4 = strongly agree and 1 = strongly disagree): (1) risk-taking behaviors (2 items; α = 0.707); (2) perceived susceptibility to disease (3 items; α = 0.741); (3) perceived seriousness of disease (3 items; α = 0.728); (4) perceived threat to disease (8 items; α = 0.896); (5) perceived high-risk procedures (6 items; α = 0.820); (6) knowledge of SPs (11 items; α = 0.937; calculated in percentages); (7) compliance of SPs (20 items; α = 0.804, with 5 = always and 1 = never); (8) perceived barriers (8 items; α = 0.837); (9) perceived benefits (2 items; α = 0.653); (10) management support from the school and clinical venues (2 items; α = 0.682); (11) adequacy of training provided (3 items; α = 0.736); and (12) nursing staff influence (1 item).

Data collection procedure

The questionnaires together with the information sheet were distributed to the target population in a classroom setting in

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