Research Article

Clinical Experiences as Related to Standard Precautions Compliance among Nursing Students: A Focus Group Interview Based on the Theory of Planned Behavior

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SUMMARY

Purpose: During clinical placements, nursing students who come into close contact with patients and provide nursing interventions may be exposed to harmful pathogens. However, little is known about nursing students’ experiences with standard precautions (SP) in clinical settings.

Methods: We conducted interviews with six focus groups of nursing students (n = 38) from two universities in South Korea. The focus group interviews each took 90–120 minutes and included 6–7 participants from two different universities. The meetings used semi-structured interview protocols. Qualitative content analysis was employed.

Results: Four themes and 9 subthemes were identified: (a) attitudes (knowledge deficit, sensitivity), (b) subjective norms (negative role models, classroom and in-field gaps, blind spots), (c) perceived behavioral control (psychological barriers, physical barriers, lack of information), and (d) intention (changes in compliance awareness).

Conclusions: These focus groups revealed that many nursing students worked in vulnerable environments and risked pathogen exposure. Nursing students expressed the importance of SP but reported witnessing many instances of failure to comply with established measures. Several barriers were explored as reasons of SP noncompliance. By removing the barriers presented in this study, nursing students would be able to perform their duties in a safe clinical environment.

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Introduction

Healthcare-associated infections are a concern for healthcare workers as well as their patients [1]. There are two tiers of Healthcare Infection Control Practices Advisory Committee/Centers for Disease Control and Prevention isolation precautions to prevent transmission of infectious agents, standard precautions (SP) and transmission-based precautions [2]. In SP, all blood and body fluids of a patient are considered potential pathogen transmitters, regardless of the suspected or confirmed presence of an infectious agent [2]. Major components of SP include hand hygiene, using personal protective equipment (PPE), respiratory hygiene or cough etiquette, safe injection practices, and infection control practices for special lumbar puncture procedures [2]. Among healthcare workers, the reported causes of SP noncompliance were related to the lack of knowledge or time, forgetfulness, skin irritation, discomfort when wearing protective equipment, and lack of training [3].

Several studies have been conducted to explore facilitators of and barriers to SP compliance for healthcare workers by applying behavioral science theory which would explain and predict human behaviors [3–6]. The Theory of Planned Behavior (TPB), developed by Icke Ajzen in 1985 [24], explains that attitudes are influenced by intention and perceived control, and intentions are influenced by psychosocial determinants such as attitudes and subjective norms [7,8]. Unlike other social cognitive models in infection control area (e.g., Health belief model, Health locus of control, protection motivation theory), the TPB emphasizes predictors related to individual intention for behaviors [9–11]. Since the TPB...
tests intentions towards specific infection control measures, such as understanding compliance with hand hygiene recommendations or physicians’ intention to wear gloves during patient care, it is perceived as the best theory for explaining why healthcare workers do not follow SP compliance even though they have greater knowledge and cognitive awareness about the importance of it (Pittet). In addition, the TPB considers the individual intention as a strong determinant in behaviors such as compliance. Recent studies have tried to explore influential factors to infection control compliance using this theory. The theory of planned action is widely used as the theoretical framework in behavioral studies and has successfully explained a variety of human behaviors and their determinants [8]. However, most current studies in evaluation of TPB [1,6,7,9,10] adopt quantitative approaches to identify specific behaviors and the related concepts in infection control areas. Glanz et al. proclaimed that “open-ended elicitation interviews” is the vital step in applying TPB when exploring the related factors of a certain behavior (Glanz et al., p. 82) such as related behavioral outcomes, facilitator and barriers. They also suggested example questions to ask of study participants emphasizing the importance to explore both negative and positive responses to questions. Using TPB the formulation of the questions and the categorizations of the answers regarding certain behaviors and its various influential factors would be provided.

Nursing students in long-term clinical placements may find themselves coming in close contact with patients and providing nursing interventions, both of which may lead to exposure to harmful pathogens. In order to minimize risk, nursing students should receive training on SP and have competence prior to their clinical rotations. There have been a few quantitative studies investigating SP compliance among healthcare workers and nursing students. However, there have been few studies exploring specific facilitators and barriers guided by TPB. In order to develop an intervention program, qualitative study dealing with specific contents perceived and experienced by participants is needed. This study attempts to explore clinical experiences of SP compliance by using TPB among nursing students in clinical practice settings in South Korea.

Methods

Study design

A qualitative descriptive study using focus group interviews was implemented. A focus group interview involves purposively selecting participants to gather opinions on a given topic within an in-depth group interview framework [12]. Participants are recruited based on criteria including similar experience on research topic, age range, similar socio-characteristics, and comfortableness with the interviewer and each other in the interview environment [13].

Setting and sample

Six focus groups including 38 senior nursing students were carried out. The focus groups were all homogeneous with respect to grade and clinical settings experience. All students from the two universities involved had similar experiences academically (participating in a 4 year university-level course offered at two local cities). Students had also finished 1 year of clinical experience in tertiary hospitals in South Korea. Those who agreed to take part were assigned to focus groups depending on personal schedules and availability.

Ethical consideration

This study was approved by the Institutional Review Board of the Semyung University Oriental Medicine Hospital, and all participants provided written consent. All participants were fully informed about the purpose of the study and that the discussions would be recorded. For confidentiality, all interview data, related descriptions, and record files were stored on the hard drive of a password-protected computer shared by only the authors; backup files were secured in locked file cabinets.

Data collection

The focus group interviews each took 90–120 minutes and included 6–7 participants from the two participating universities. A moderator and an assistant led three focus group interviews at each study site. The research team created a structured interview guide for this study and utilized the theoretical framework of TPB to guide the focus group interviews (Table 1). Based on reviews of the literature [1,14], questions were developed to explore analysis with attitudes, subjective norms, perceived behavioral control, and intention. All students were asked to describe various experiences related to their observations and compliance of SP. All questions were open-ended.

Data analysis

Qualitative content analysis was used to code and analyze the data from the focus group interviews. Qualitative content analysis guides analysis with least interpretation, and offers a comprehensive summary [15] that proves to be a good fit for the purpose of focus group interview methods.

All interviews were conducted and transcribed verbatim by research assistants in attendance. Analysis followed the general approach of content analysis put forth by Krueger and Casey [12] and Nyamathi and Shuler [16]. The unit of analysis was done on the participant’s response per question. Two researchers read each transcript several times to familiarize and get a sense of the entire interview, and fully understand the content. During this stage, researchers noted key ideas and recurrent codes. Initial coding was given to break the text into meaningful segments. Primary coding was performed with a low level of inference by each author and initial codes and preliminary codebook was created during this

<p>| Table 1 Focus Group Discussion Topics. |</p>
<table>
<thead>
<tr>
<th>Topics</th>
<th>Questions</th>
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<tbody>
<tr>
<td>Attitudes</td>
<td>Have you ever heard of SP?</td>
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<tr>
<td></td>
<td>What is the SP?</td>
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<tr>
<td></td>
<td>Is it necessary to follow SP at the clinical practice as a nursing student?</td>
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<tr>
<td></td>
<td>How much valuable is it to follow standard precaution in clinical practice?</td>
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<td></td>
<td>What do you think of the risk of infection exposure when nursing students did not comply with SP?</td>
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<tr>
<td>Subjective norms</td>
<td>What was your experience of nurses’ SP compliance during clinical practice?</td>
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<td></td>
<td>Have you received direct or indirect SP education from nurses or head nurses?</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>Do the nurses in clinical practices think that nursing students should always follow SP?</td>
</tr>
<tr>
<td></td>
<td>What was the situation in which you did not follow SP?</td>
</tr>
<tr>
<td></td>
<td>Does anything prevent nursing students from following SP?</td>
</tr>
<tr>
<td>Intention</td>
<td>Have you experienced difficulties in following SP due to the clinical settings (facilities, goods)?</td>
</tr>
<tr>
<td></td>
<td>Do you intend to always follow SP during clinical practice?</td>
</tr>
</tbody>
</table>

Note. SP = standard precautions.
stage. Then the researchers reached consensus on regarding developing one codebook and achieving an initial 48 codes and 10 categories. Both researchers coded independently. To improve inter-rater reliability, the researchers reviewed codes and categories to reach a consensus on creating and matching themes. Data rearrangement, mapping and interpretation were conducted over several meetings [12,16]. In the final analysis, nine subthemes of experiences emerged relating to the influence of SP compliance within the four constructs of TPB (four themes); the subthemes were matched by TPB theory.

Results

Attitudes

Knowledge deficit

Most of the students in the study did not know the exact concept of SP or had confused SP with general infection control practice. Participants expressed that they had heard the term but did not know the specific definition of SP or its measures: “(I think SP is) such basic things as isolation, hand washing, hand hygiene, and wearing masks for infection control.”

Many students understood SP as the acceptable hand hygiene sequence performed to prevent cross-infection. One student said, “When you are following a procedure, things should be done in a particular sequence to prevent any infection, like you wash your hands before and after a certain procedure.”

Sensitivity

Although participants had a vague understanding about SP concepts, they were aware of the risk of being exposed to specific pathogens during clinical practice. However, this awareness was limited to an abstract understanding as opposed to practical demonstration: “I think infection control is important in hospital where emergencies can happen. I can be infected when such emergencies happen, you know.” Another participant stated, “I know that I should wash my hands. But when there’s no blood or body fluids on patients, I do not think that I can be infected.”

Subjective norms

Participant experiences regarding subjective norms were assigned to the categories of negative role models, classroom and in-field gaps, and blind spots.

Negative role models

Most students shared negative SP experiences from their clinical placements. Except for a few clinical rotations that took place in special units like operating rooms, intensive care units, and hemato-oncology wards, nursing students generally witnessed SP noncompliance by healthcare workers. Study participants discussed various situations related to noncompliance, including poor hand hygiene, the nonuse of PPE, and poor needle recapping. One student noted, “I don’t think nurses think that they must follow the SP.” Another remarked, “You know you must wash your hands before you see the next patient after the previous patient. But nurses don’t wash their hands that often in hospital wards, especially in adult care units.”

Classroom and in-field gaps

Participants reported that the practices they experienced in clinical settings were quite different from what they had learned in class. Students shared the difficulties of practicing SP compliance during daily basic nursing care activities. One student said, “Sometimes it feels so natural that I don’t follow the SP … And I think this is not what I learned in school. But in hospital, the things I learned in school seem so distant and theoretical, and I get confused … Maybe I’m not remembering things right.”

One participant remarked, “I learned that povidone-iodine should be dried up to be effective, but my preceptor told me to wipe out it with alcohol swap in the hospital.”

Blind spots

Some clinical organizations monitored the nursing students’ nursing care activities and paid close attention to the SP compliance of students during orientation and education sessions. However, most settings did not follow these measures. One participant shared, “I don’t think nurses care much about us because they are too busy. They don’t pay attention to what we are doing; they just do what they need to do.”

Usually monitoring and education is the main responsibility of the head nurse, which led one participant to remark, “I don’t think the head nurse is aware that we are exposed to risk of infection. I think the head nurse doesn’t know that we not only check blood pressure or do blood sugar tests, but also do things that expose us to a patient’s body fluid and blood.”

Perceived behavioral control

Participants discussed various psychological and physical barriers, as well as the lack of information provided in clinical settings, which made it difficult to comply with SP.

Psychological barriers

Study participants experienced a variety of psychological barriers, such as worrying about patient discomfort, dealing with their own immaturity and fear, being emotionally uncomfortable, and feeling overwhelmed by tasks. Most participants shared that their SP compliance training during their clinical rotations was limited to following the lead of their nursing supervisors. One student explained, “When my supervisor follows the SP, I do as well, washing my hands and stuff. When I’m with this supervisor who does not follow the regulations, I skip washing hands. Just like that.”

Nursing students complained about the difficulties of SP compliance when they were with nurses with poor compliance behaviors. Since these role models were the students’ educational preceptors, they felt they could not comply with SP unless their mentors did: “I don’t know, but maybe if the patient was recovering, my supervisor sometimes did but sometimes didn’t wear a mask. I feel a little weird to wear a mask when my supervisor doesn’t.”

Being busy was also another barrier that interfered with SP compliance for students: “I did a lot of vital sign checking when I worked at the department of internal medicine. Because I was usually behind schedule, all I could think of was next, checking vital signs of the next patient. I often forgot to wash my hands, or to use hand sanitizer.”

In particular, PPE guidelines were considered even more difficult to follow than hand hygiene if a supervisor did not follow it: “When it comes to hand hygiene, there is alcohol-based hand rub by each bed, you know. I think I can do that. But protective equipment … I think I’d wait and see what my supervisor does.”

Physical barriers

Study participants experienced various physical limitations as well as psychological barriers to SP compliance during their clinical training. They complained of difficulties due to limited availability of PPE and a lack of accessibility to the equipment: “Since we are only trainees, we can’t use stuff without permission. I think that’s
why we get a little cautious when it comes to using protective equipment.”

Another participant shared her experience: “In most cases we don’t know where things are because our supervisors didn’t tell us. They don’t tell us where masks are, for example … there are many times we learn where they are by asking other students. I think that’s the biggest obstacle.”

**Lack of information**

Nursing students expressed that they are not given enough patient information, and it was another barrier in SP compliance. The nursing students were not considered healthcare workers during their clinical rotations. As a result, they were provided with limited information about patient situations: “You know, there are isolation wards in hospitals for tuberculosis patients and so on, and each hospital has its own way of marking those zones with different colors. Students who start training at the hospital don’t know what the color codes mean unless their supervisors explain them. There is a risk of infection when students enter a zone without knowing it was an isolation room.” “Even when there are patients we should not approach, the hospital staff members simply tell us not to enter the ward where the patients are. They usually don’t explain why we should not enter the ward.”

Participants reported the lack of systematic education about SP compliance and hospital guidelines provided to students. Some students shared their experiences with blood and body fluid exposure, where the post-exposure procedures were not performed properly. One student said, “Blood splattered on my face, hands, and clothes. … I had no cuts or anything on my skin, and the blood didn’t get to any mucous membrane, so I thought I had no chance of infection … I just left the room and washed my hands. I couldn’t wash my face (during training), and washed my clothes after the duty ended.” This means that SP measures in the clinical practice had not been delivered to students via education.

**Intention**

Even though there are various situational constraints and barriers for nursing students, participants noted the importance of individual compliance and intention to comply. They confirmed that an awareness of the importance of SP compliance is the start of practicing SP in clinical settings. However, they also experienced changes in their compliance awareness after they consistently observed healthcare workers engaging in noncompliance behaviors.

**Changes in compliance awareness**

Most participants learned and recognized the importance of SP compliance during class, but in focus group interviews they discussed a cognitive change towards an understanding of “do not need to keep” when they observed healthcare workers’ noncompliance with guidelines. One student said, “At first I followed the SP. But as I see the practitioners who have been working for a long time ignore the SP—it’s rare to see anyone who abides by them—I get to think that I don’t really need to follow them.”

**Discussion**

This study explored Korean nursing students’ experiences with SP compliance as a method to prevent occupational exposure to microorganisms within clinical settings. Using TPB as its theoretical framework, this study closely focused on the students’ explanations of SP compliance in their clinical rotations. Interestingly enough, this study found that the general vulnerability of nursing students at their clinical sites and their reliance on mentors for information and guidance led to strikingly different compliance experiences than those reported by healthcare workers [3,17].

Although students participating in the study had learned about SP in their fundamentals of nursing and microbiology classes, most did not know much about the purpose and importance of SP. This is consistent with previous studies that found SP knowledge in nursing students to be relatively low [18,19]. Participants reported confusion about the concept of SP and general infection control. Aware that they are at risk for pathogen exposure in clinical practice, students did not have a strong understanding of protection as a core concept of SP. The fact that students are aware of the risk of exposure to pathogens but less familiar with the SP guidelines means that students do not know how to protect themselves from the risk of exposure. Yang’s survey (2007) [20] on cognition and application about SP for practical nurses in China revealed that nurses did not have a good understanding of the concept and characteristics of SP even though 67.8% had been exposed to SP guidelines in school and 92.2% had received SP education in hospitals. This shows that lack of knowledge is not an issue specific to nursing students in Korea. Korean nursing students are involved in clinical training during their third and fourth years of study. This study’s participants asserted that they did not receive any SP education before their training started at their clinical sites. This suggests that education on SP compliance is needed for students at their clinical sites before their training begins as well as in school.

Nursing students’ experiences of noncompliance are quite different from those of nurses due to the relatively low status of students within the information hierarchy. Students are not able to control resources and barriers within their working environments during their clinical rotations. In particular, participants experienced the absence of positive subjective norms and the presence of various barriers that need to be removed.

The SP compliance demonstrated by healthcare workers, particularly nurses, affects students’ perceptions and behaviors during clinical training. In previous studies, the reasons for SP noncompliance given by nurses included the following: “lack of time”, “puts patients at risk”, “lack of means”, “precautions not warranted”, “interferes with patient care”, “forgetfulness”, “lack of knowledge”, and “distance to necessary equipment or facility” [3,17]. Interestingly, most of this study’s participants witnessed SP noncompliance by nurses in the general ward. Participants said that some nurses admitted to their noncompliance and then explained what they should follow as guidelines to the students. Others were not even aware of their noncompliance behaviors. These situations imply that students are in inappropriate or negative educational situations. According to Erasmus et al. [14]; the noncompliance of healthcare workers is one cause of the noncompliance of students. Nurses’ SP noncompliance models poor practices to students, and seriously and directly affects changes in compliance awareness and noncompliance behaviors. In addition, participants admitted that they had been in situations of noncompliance. They experienced a decreased awareness of SP compliance and its importance when they provided basic nursing care to patients. Despite the students’ involvement in primary care, their activities fell within healthcare workers’ blind spots in most situations. This issue appears indirectly related to the problems in the clinical training portion of nursing education in Korea. Since the workload of nurses in the field is high, student training becomes yet another burden on their overloaded schedules.

For the perceived behavioral control aspect of TPB, students discussed the situational environments that prevent them from SP compliance. They shared various psychological and physical limitations and the consequences of limited information. The important cultural characteristic that emerged is that nursing students are aware of “cues” from their clinical preceptors regarding SP...
compliance. Students discussed cases of poor-compliance modeling and mentioned the difficulties in adhering to SP compliance when they were partnered with noncompliant nurses. The students mentioned the ambiguous position of a student nurse within clinical practice hierarchies and how this can lead to limited access to patient information and limited access to standardized nursing practices. This lowly position in the hierarchy also discouraged the students from proactively seeking information about SP compliance; they were expected to simply do as their work superiors did, without question. Disturbingly, following a supervisor’s noncompliance behaviors was given as the main reason students did not comply with SP. Above all, students perceived their positions as socially indefinite, being neither nurse nor student, making it difficult to independently comply with SP during their clinical training.

Furthermore, students experienced limited PPE accessibility. For SP compliance, students should have free access to protective devices and no limitation on their usage. However, most participants did not even know the location or availability of protective equipment. In one study based in Korea, 36.4% of nursing students who had experienced pathogen exposure did not wear masks [18]. Efstathiou et al. [3] and Erasmus et al. [14] performed qualitative research directed towards SP compliance and hand hygiene in healthcare workers. In these studies, lack of accessibility and availability of protective equipment was an important barrier to SP compliance for nurses. However, nurses’ limited accessibility to PPE is different from the experiences of nursing students. While nurses have limited access because of a supply deficiency [3], nursing students’ PPE accessibility is related to a lack of education about PPE location from preceptor nurses.

Additionally, students did not have enough information about their patients’ diseases or the organizational guidelines of SP. As a student in the field, they experienced difficulty in identifying exposure risks, which then led to problems with SP compliance. Because of the electronic medical record system in many Korean hospitals [21], students have limited access to patient information. This means students do not get information about patients with harmful pathogens unless nurses specifically tell them, leading to difficulties in maintaining compliance during patient care. According to Kim and Lee [1]; perceived behavior control was revealed as a direct and main influencing factor for nursing students’ performance related to healthcare-associated infections; intention was not a significant determinant. Our study supports the concept that various barriers such as perceived behavior control could negatively affect SP compliance even though students have positive attitudes and the intention to perform SP. As discussed above, participating students found themselves inhabiting the nursing staff’s blind spot and did not receive proper care and education during clinical training. According to previous study, students’ perception of risk is the most significant predictor followed by emphasis of formal nursing educators [22]. One intervention study reports that multi-faced education about hand hygiene, handling of needles and use of PPE was beneficial for increasing SP compliance for healthcare workers [23]. Therefore, detailed and direct face-to-face education about SP guidelines for nursing students might contribute to increasing compliance rates.

Nursing students are the nurses of the future, so compliance education and a student’s intention to follow compliance are directly related to a nurse’s commitment to compliance. Study participants expressed that their awareness and intention changed during clinical training. Specifically, they felt that they did not need to follow SP compliance since nurses did not. This cognitive shift could influence their future SP compliance as nurses. Therefore, exploring the factors affecting SP compliance for nurses in charge of student clinical education is needed. In addition, faculty should develop continuing education programs that include discussions on SP compliance, infection control guidelines, and noncompliance cases, then reinforce the SP compliance education component before clinical placements begin. These steps would be helpful in preventing cognitive changes in the importance of SP compliance.

One study limitation is that we were unable to draw conclusions related to causes of SP noncompliance for nursing students across different geographical and educational environments. Although we suspect that the clinical experience related to SP noncompliance varies depending on educational environments, further research is required to test this hypothesis. In order to test hypotheses, instrument is currently under way to develop and test SP noncompliance as well as to examine differences across different institutions.

Conclusion

In this study, we discovered that nursing students found themselves in vulnerable situations and risked exposure to pathogens due to SP noncompliance. Several barriers were explored as the reasons of SP noncompliance. In order to increase SP compliance for nursing students, barriers for attitudes, intention, perceived control, and subjective norms guided by TPB were explored. By removing the barriers presented in this study, students would be able to follow SP compliance and do their clinical training in a safe environment. Consistent supervision and education of infection risks for nursing student are required.

Conflict of interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

References