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## Major articles

## Working in a danger zone: A qualitative study of Taiwanese nurses' work experiences in a negative pressure isolation ward

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**Key Words:**

Negative pressure isolation ward  
infected patient  
caring experience  
nurse  
qualitative study

**Background:** Hospital nurses are frontline health care workers in controlling the spread of infectious diseases. It is not known if nurses working in negative pressure isolation wards (NPIWs) are better prepared than before to safely care for patients with common infectious diseases.

**Methods:** For this qualitative descriptive study, 10 nurses were interviewed in depth about their experiences caring for patients in an NPIW. Tape recordings were transcribed verbatim and analyzed by qualitative content analysis.

**Results:** The following 5 themes were identified: (1) complexity of patient care, (2) dissatisfaction with the quantity and quality of protective equipment, (3) shortage of nursing staff, (4) continued worries about being infected, and (5) sensitivity to self-protection. Our participants' anxiety and uncertainty about being infected in the NPIW were increased by the complexity of patients' health problems and organizational factors. To protect themselves against infection before and during patient care, participants also developed sensitivity to, concepts about, and strategies to improve self-protection.

**Conclusions:** NPIW administrators should pay more attention to nurses' concerns about improving the NPIW working environment, supply good quality protective equipment, and provide appropriate psychologic support and ongoing education to ensure that nurses feel safe while working. This ongoing education should refresh and update nurses' knowledge about disease transmission, therefore decreasing unnecessary anxiety based on misunderstandings about becoming infected.

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All health care workers face a wide range of hazards on the job, including blood and body fluid exposure; therefore, protecting workers from communicable infections is essential to promote their health and safety and to maintain the functioning and capacity of the health care workforce.<sup>1-3</sup> Nursing personnel often experience these hazards most frequently because they comprise the largest group of health care workers in Western developed countries and Taiwan.<sup>4,5</sup> Furthermore, because nurses are at the forefront in caring for patients, ensuring their safety when caring for patients with infectious diseases is critical. Patients who pose a risk of passing a potentially harmful infection to others are quarantined in isolation wards.<sup>6</sup>

However, nurses working in isolation wards have a higher risk than other health care workers of being infected by patients.<sup>7</sup>

To increase health care workers' knowledge of and adherence to infection control in low-resource settings, staff education programs should emphasize that basic self-protection measures, such as routine hand hygiene, are an important part of care responsibilities.<sup>8</sup> Another important aspect of infection prevention and control in health care settings is using personal protective equipment, including gloves, eye protection, head and shoe coverings, and respirators or facemasks.<sup>9</sup>

Infection prevention and control measures were seriously challenged in approximately 30 countries, including Taiwan, by the 2002 worldwide epidemic of severe acute respiratory symptom (SARS).<sup>10</sup> After the SARS epidemic, the Taiwanese government required that all newly hired health care workers, including nurses, attend 8 hours of infection control-related educational courses within their first

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3 months of employment and that all health workers attend at least 4 hours of infection control–related educational courses annually.<sup>11</sup> Both physician and nursing staff on infection control wards were also required to attend 20 hours of training per year.<sup>11</sup> However, the work of preventing health care–associated infections should rely not only on health care workers' skills in self-protection, but also other factors, including patient variables (eg, severity of illness, extent of debilitation), care variables (eg, antibiotic use, use of central venous catheters), and organizational variables (eg, nursing workload, nurse-patient ratio).<sup>12</sup>

Indeed, a systematic review of 92 studies concluded that effective infection prevention in hospitals should include, among other components, infection control at the hospital level; optimal bed occupancy, staffing, workload, and accessibility to protective equipment; education and training; and a positive organizational culture.<sup>13</sup> Similarly, nurses' adherence to proper infection control practices in busy and complex health care settings should be enhanced by ready availability of equipment, training to use it, training to use its proper fit, organizational support for workers' health and safety, and good communication practices.<sup>14</sup>

In sum, the work of fighting infectious diseases in hospitals relies on the availability of protective equipment, infection control training, organizational support for workers' health and safety, good communication practices, and health care workers' correct application of infection control procedures. More than a decade after the SARS epidemic, it is not known whether Taiwanese nurses who work in a negative pressure isolation ward (NPIW) are better prepared than before to safely care for patients with common infectious diseases. Therefore, this qualitative descriptive study aimed to explore Taiwanese nurses' experiences and concerns about working in an NPIW.

## METHODS

### *Research design*

This descriptive qualitative research study was approved by the institutional review board of the study site (CE13023) before participants were recruited and data were collected.

### *Setting and participants*

This study was conducted in the NPIW of a medical center in central Taiwan. Patients in this NPIW were frequently diagnosed with AIDS, tuberculosis (TB), and scabies. Purposive sampling was used to recruit nurses who met these criteria: (1) had at least 2 years of work experience in an NPIW, (2) worked in the NPIW of the study site, and (3) voluntarily agreed to participate in this study. Of the 15 nurses who met these criteria, 5 refused participation because of lack of interest ( $n = 3$ ) or they were too busy ( $n = 2$ ). Therefore, the final sample included 10 nurses.

### *Data collection*

Data were collected by the second author in semi-structured in-depth interviews conducted in the meeting rooms of the NPIW. Participants were asked to describe their experiences of working in an NPIW and their concerns and difficulties in caring for patients in the NPIW. All interviews were tape recorded with the participants' agreement. Each interview lasted 1–2 hours.

### *Data analysis*

All tape-recorded interviews were transcribed verbatim and analyzed by all authors using the qualitative content analysis suggested

by Krippendorff.<sup>15</sup> This process included (1) recording both verbal and nonverbal interactions between the interviewer and participants as narratives (data); (2) reading and rereading the entire data transcriptions to obtain an overall understanding of the data and to become familiar with it; (3) highlighting and marking important experiences in the transcripts; (4) searching for meaning units and developing an initial list of ideas about the data, from which initial codes were generated; and (5) reviewing these initial codes to discover the themes. During this process, the relationships between codes and themes were compared repeatedly. Finally, we identified 5 themes.

### *Trustworthiness*

Trustworthiness of the data was evaluated by the following 4 criteria: credibility, transferability, dependability, and conformability.<sup>16,17</sup> Credibility of the data was enhanced by the authors' expertise in nursing and qualitative research, allowing us to fully understand the participants' work experiences and perspectives regarding the related issues. Transferability was increased, and the data sources were enriched by including participants of different ages and nursing work experiences. Dependability was promoted by the authors meeting frequently to discuss the data analysis and by checking and rechecking the labeling, sorting and naming of themes during data analysis, for verification as suggested.<sup>18</sup> Participants' experiences were extracted as thick descriptions of the related phenomenon.

## RESULTS

### *Participants' characteristics*

The 10 participants were all women, with a mean age of 31.5 years old (range, 23–50). Most participants were unmarried ( $n = 8$ ) and had a bachelor's degree ( $n = 9$ ); only 1 had graduated from a 5-year junior nursing college. The participants had worked as nurses on average for 9 years (range, 2–23) and in the NPIW on average for 4.9 years (range, 2–9). Half of the participants had work experiences in other nursing units (medical and surgical wards), whereas the remaining 50% had worked in the NPIW since they graduated from nursing school.

### *NPIW work experiences*

Data analysis revealed that nurses' experiences of working in the NPIW were captured by 5 themes: (1) complexity of patient care, (2) dissatisfaction with the quantity and quality of protective equipment, (3) shortage of nursing staff, (4) continued worries about being infected, and (5) sensitivity to self-protection. Details of the 5 themes and supporting extracts from participants' interviews are subsequently presented.

### *Theme 1: Complexity of patient care*

Patients in the NPIW tend to be diagnosed with TB, AIDS, and scabies, which are all highly infectious. However, the participants described patients admitted to the NPIW as usually having other conditions besides their suspected or diagnosed infectious disease. Because one of their diseases is highly infectious, they cannot be transferred to the intensive care unit, even if their health condition is critical. Additionally, nurses' workload is increased because patients' family members cannot enter the NPIW to provide company for patients and help care for their daily needs. Furthermore, patient compliance with self-management tends to be poor. These situations increase the difficulty of nursing care and the time nurses in

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