Students' Experiences in Undertaking Nursing Professional Practice During the COVID-19 Pandemic: A Case Study of Strengthening Clinical Adaptation in Taichung City

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Article Info	ABSTRACT
	Purpose of the study: This study aims to explore in depth the experiences of nursing students in performing professional practice during the COVID-19 pandemic, including the challenges, adaptation strategies, and learning processes that emerged in a hospital setting. **Methodology:** This study used a qualitative descriptive method with in-depth interviews. Data were collected using semi-structured interview guides, audio-recording tools, and verbatim transcription. Thematic analysis was performed using manual coding supported by Microsoft Word and Microsoft Excel to categorize themes and sub-themes. **Main Findings:** The study identified three major themes: the use of personal protective equipment, students' concerns regarding virus transmission, and obstacles encountered during clinical practice. Students reported fear of contracting and transmitting the virus, limited patient interaction, and reduced opportunities for hands-on learning. They developed self-adjustment strategies such as consistent PPE use, maintaining physical immunity, and seeking supervision support. **Novelty/Originality of this study:** This study offers new insight by capturing the unique clinical learning experiences of nursing students during a global health crisis, emphasizing the intersection between psychological stress, safety compliance, and clinical learning limitations. It contributes new knowledge on how pandemics reshape professional nursing education and highlights the need for adaptive, resilient clinical training models.

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1.   INTRODUCTION

The COVID-19 pandemic has placed unprecedented pressure on healthcare education systems worldwide, including nursing education. Rapid changes in healthcare protocols, limited patient interactions, and the high risk of infection exposure require nursing students to adapt quickly to a highly dynamic clinical environment [1], [2], [3]. Numerous global studies have highlighted the challenges nursing students face during the pandemic, such as limited hands-on experience, fear of transmission, and changes in clinical supervision

methods [4], [5], [6]. However, students' experiences adapting to clinical practice in a highly technologically prepared hospital environment, such as Taiwan, have rarely been explored in depth.

Taiwan, particularly Taichung City, is a region experiencing rapid development in the healthcare and medical technology sectors [7], [8], [9]. The city boasts several leading healthcare centers, including teaching hospitals that utilize digital systems, implement stringent safety protocols, and implement technology-based clinical learning models [7], [8], [9]. This combination makes Taichung a unique location to examine how nursing students navigate clinical practice during the pandemic [13], [14], [15]. However, most existing research focuses on the experiences of Taiwanese students in general or examines psychosocial aspects, while clinical adaptation within the context of professional practice in a developing city like Taichung remains largely overlooked.

This research gap is evident in the lack of studies specifically analyzing the clinical adaptation process of nursing students in a city with advanced healthcare facilities but still facing significant pandemic pressures [16], [17], [18]. Some studies have focused on the impact of the transformation to online learning, while research on students' direct experiences responding to changes in clinical protocols, patient interactions, and safety standards during practice remains limited [19], [20], [21]. Furthermore, there is limited research describing how educational institutions and hospitals in Taichung develop adaptive strategies that strengthen student competencies amidst the global health crisis.

The urgency of this research lies in the importance of understanding nursing students' adaptation mechanisms as a basis for developing a more crisis-responsive practice curriculum [22], [23]. Given that the COVID-19 pandemic has not only had short-term impacts but has also prompted permanent changes to clinical practice standards, obtaining an empirical overview of student experiences in this high-pressure environment is crucial [9], [14], [24]. The results of this study can provide strategic contributions to nursing educational institutions, hospitals, and policymakers in developing professional practice guidelines that are more resilient, safe, and relevant to future healthcare needs.

The novelty of this study lies in its focus on strengthening the clinical adaptability of nursing students in the context of a developing city with advanced healthcare infrastructure, namely Taichung City. The case study approach in this region provides a new perspective on how students navigate professional practice experiences amidst strict health protocols, the integration of medical technology, and the dynamics of healthcare services during the pandemic. By highlighting the interplay between Taiwan's healthcare system preparedness and students' adaptability, this study makes an original contribution to the literature on nursing education during times of crisis.

Overall, this study not only offers an in-depth understanding of nursing students' experiences during the pandemic but also provides a conceptual framework that can be used to strengthen clinical learning readiness in facing future global health challenges.

2. RESEARCH METHOD

This study employed a qualitative approach with a descriptive phenomenological design. This approach was chosen to explore in-depth the subjective experiences of nursing students practicing during the COVID-19 pandemic, specifically within the clinical context in Taichung City. Qualitative research allows researchers to gain a comprehensive understanding of individual feelings, perceptions, beliefs, and motivations [25], [26]. Descriptive phenomenology, meanwhile, was used to identify the essential meaning of the lived experiences of students directly involved in clinical practice during a global health crisis. This approach requires researchers to understand the phenomenon from the participants' perspectives through intense and reflective engagement to discover consistent patterns of meaning [27], [28], [29].

This research was conducted in a natural setting, namely a clinical practice environment that operates as it is without researcher intervention. The researcher's presence did not influence the social dynamics and activities of participants. The research focus was not limited to a specific variable but rather examined the entire social situation, including the place, actors, and activities. These three aspects are crucial for understanding how students navigate the demands of clinical practice, safety protocols, interactions with healthcare professionals, and the use of medical technology during the pandemic. A comprehensive understanding of this social context forms the basis for uncovering students' authentic experiences within the context of clinical practice in Taichung.

This study employed a purposive sampling technique, selecting informants based on the research objectives and specific considerations related to relevant experiences. The inclusion criteria included:
1. Nursing students from Aufa Royhan University.
2. Nursing students conducting clinical practice during the COVID-19 pandemic.
3. Students with good verbal communication skills.

Exclusion criteria included:
1. Individuals who are not nursing students at Aufa Royhan University.
2. Students conducting clinical practice outside of the pandemic.

3.   Students not enrolled in a nursing program..

This sampling technique ensures that the data obtained comes from participants with direct and relevant experience with the phenomenon under study.

In qualitative research, the researcher is the primary instrument (human instrument). The researcher served as data collector, interpreter, and analyst. The concept of epoche/bracketing was implemented by suspending assumptions, personal experiences, and biases that might influence the data collection process. Thus, the meaning of the experience was obtained purely from the participant's perspective [30], [31].

In addition to the researcher, supporting instruments included:

- In-depth interview guides,
- Audio recorders,
- Field notes, and
- Institutional documents related to the implementation of nursing professional practice.

Secondary data was obtained from the Nursing Professional Study Program at Aufa Royhan University, including academic records and archives related to students conducting clinical practice.

To ensure data validity, this study utilized source triangulation. Triangulation was conducted by comparing information from in-depth interviews, field observations, and supporting documents such as photographs, academic reports, and clinical practice guidelines. This technique provided a broader perspective and strengthened the credibility of the findings. Discrepancies or congruences in data obtained from various sources were analyzed to generate a more comprehensive and reliable understanding [32], [33].

Data analysis was conducted using domain analysis to obtain a comprehensive picture of students' experiences during their nursing professional practice in Taichung City. This technique enabled researchers to identify categories of meaning based on statements and narratives provided by informants. The analysis process included organizing raw data, initial coding, identification of domains of meaning, synthesis of experience patterns, and drawing conclusions linked to theory and empirical findings.

The analysis was conducted iteratively until a stable and representative concept was obtained. Each finding was then discussed with relevant theory to ensure epistemological consistency and generate stronger interpretation.

3.   RESULTS AND DISCUSSION

The results of this study revealed several themes that can be explored when students practice nursing. The results consist of two parts. The first part briefly describes the characteristics of the participants in this study, and the results of thematic analysis interviews for each theme.

3.1. Participant Characteristics

Participants in this study were students practicing nursing during the pandemic. There were five participants. The five participants who were sampled in this study met the criteria and agreed to be interviewed and signed a consent form prior to the interview. All participants were students practicing nursing during the pandemic. Participant characteristics in this study included age, gender, and marital status. Of the five participants, the majority were between 24 years old (n=5, 100%), male (n=1, 20%), female (n=4, 80%), and married (n=0, 0%).

Table 1. Demographic data can be seen in the table

Characteristics	Frequency	Percentage (%)
Age: 24 Years	5	100
Gender:		
Male	1	20
Female	4	80
Total	5	100

The themes found from the interview results were 3 themes and 5 sub-themes that described students' experiences in carrying out nursing professional practice during the Covid-19 pandemic. These themes are (1) Efforts to reduce the transmission of Covid-19 (PPE used when carrying out practice in hospitals) (2) concerns when meeting patients who are positive for Covid-19 (fear of contracting the virus, fear of bringing the virus to the family). (3) Obstacles when carrying out practice in hospitals (few patients, patients who do not want to be treated by students)
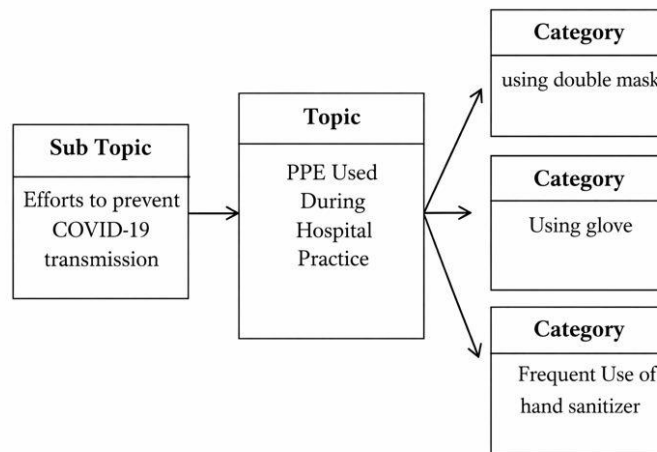
Figure 1. Scheme 1: Efforts to reduce the spread of COVID-19

Students expressed concerns during their internships in hospitals, which led to actions they had to take. Based on interviews with the five participants, these actions were taken when: (1) they were afraid of contracting COVID-19, and (2) they were afraid of bringing the virus home to their families.
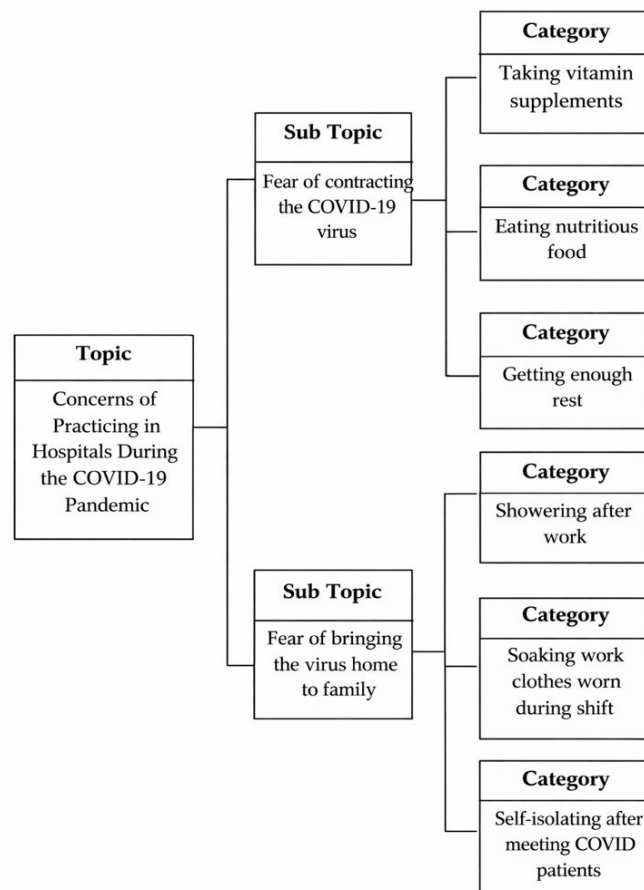

Figure 2. Theme scheme 2. Concerns when practicing during the Covid-19 Pandemic

Students experienced several obstacles when practicing in hospitals. Based on interviews with the five participants, these obstacles included: (1) limited number of patients in the hospital (2) patients unwilling to be cared for by students.

Participants in this study stated that they saw few patients in the hospital during their internship due to fear of contracting COVID-19 and being hospitalized. a. Patients Fear of Contracting COVID-19. Participants revealed that patients were afraid of contracting COVID-19, as quoted by the following participant: "There are

few patients (shaking head) because it's the pandemic. Maybe people are afraid of being hospitalized because they're afraid of contracting COVID-19. Some patients also don't want their relatives to provide care. They trust hospital staff more than their fellow interns, so the care provided is also limited during the pandemic."

Table 2. Theme matrix student experiences in carrying out nursing professional practice During the COVID-19 pandemic

No	Themes	Sub-Themes	Kategori
1	Efforts to reduce the spread of COVID-19.	PPE used during hospital practice	1. Double mask 2. Use hand sanitizer 3. Diligent use of hand sanitizer
2	Concerns about Practicing During the COVID-19 Pandemic	Fear of contracting the COVID-19 virus Fear of bringing the virus to family	1. Use complete PPE 2. Take vitamins 3. Get enough rest 1. Cleanse yourself/shower 2. Soak your uniform worn at the hospital 3. Self-isolate
3	Barriers to Practicing in Hospitals	Few patients Patients unwilling to be treated by students	1. Fear of contracting COVID-19 2. Fear of being hospitalized 1. Little action can be taken 2. Have more trust in hospital employees

The findings showed that all participants used complete PPE, including medical masks, gloves, face shields, and strict hand hygiene procedures. The subtheme "efforts to avoid exposure to COVID-19" emerged because students felt they were at high risk, especially when working in fluctuating patient care settings during the pandemic. This finding is consistent with the research of [34] that healthcare worker compliance with PPE use is a critical determinant in preventing exposure to infection. Furthermore, WHO guidelines emphasize that healthcare workers must implement personal protective standards, including handwashing, respiratory hygiene, and the use of PPE appropriate to the level of exposure risk.

However, unlike experienced healthcare workers, nursing students face greater adaptation challenges because they are in the transition to clinical professionalism [35], [36]. In the context of Taichung City, with its stringent infection control standards, the use of multiple PPE often leads to fatigue, limited mobility, and difficulty communicating with patients. This suggests that clinical practice in countries with stricter health regulations presents additional challenges for international students or local students with limited experience.

Two subthemes emerged in this category: fear of contracting the virus and fear of transmitting the virus to family. This anxiety is universal among healthcare workers during the pandemic, but for students, the intensity of anxiety tends to be higher due to limited clinical experience. This finding aligns with [37], who stated that anxiety arises as a normal reaction to physical threats and uncertain environments. Showed that healthcare workers' families experienced emotional distress due to concerns about family members being exposed to COVID-19 [38], [39], [40]. This situation was exacerbated by drastic changes in shift patterns, isolation policies, and uncertainty related to virus mutations.

In Taichung City, despite Taiwan being known as the country with the best COVID-19 response at the start of the pandemic, students continued to experience psychological distress due to the stretching of clinical protocols, strict screening processes, and restrictions on social interaction. This demonstrates that good public health standards do not automatically reduce student anxiety; on the contrary, the stricter the regulations, the greater the pressure to adapt.

Key barriers identified included limited patient numbers and patient refusal to be treated by students. During the pandemic, some service units limited the number of non-COVID patients, limiting students' opportunities to learn clinical skills. Furthermore, some patients prefer to be cared for directly by professional nurses rather than students, due to concerns about transmission or distrust in the students' abilities. This phenomenon also occurred in Taichung, particularly during the peak period of the pandemic when hospitals limited the number of interns to reduce the risk of cross-contamination [41]. This situation resulted in a decrease in the variety of cases seen by students and potentially hindered the achievement of certain clinical competencies. Thus, the learning experience was suboptimal, even though students continued to seek experience through intensive observation and direct supervision.

Although various studies have addressed the experiences of nursing students during the COVID-19 pandemic, most studies have focused on the context of their respective countries of origin, such as Indonesia, the Philippines, the United States, and Europe. These studies have yielded relatively homogeneous findings regarding the challenges of online learning, clinical anxiety, and changes in the practice curriculum. However, in-depth studies of the experiences of students practicing nursing in a more structured healthcare system, such as in Taiwan, particularly in a developing city like Taichung, are still very limited. Previous research has

emphasized psychological burden and occupational safety, but has not explored the mechanisms of clinical adaptation, cross-cultural interactions, and the integration of patient safety standards implemented in Taiwanese institutions. This research gap highlights the need for studies that not only describe the challenges, but also identify successful adaptation strategies within an international practice environment that has remained stable during the pandemic.

The novelty of this study lies in its focus on combining the experiences of nursing students with the context of clinical adaptation strengthening during the pandemic in Taichung City, Taiwan—a city characterized by advanced healthcare services, the implementation of data-driven health protocols, and strong academic-clinical partnerships. This study not only describes barriers to practice but also specifically evaluates how students develop clinical flexibility, cross-cultural competence, and professional coping strategies in a global practice environment. This approach places the research in a broader perspective than domestic studies, examining how Indonesian students navigate culturally diverse healthcare systems, documentation standards, and clinical workflows. Thus, this study offers a novel contribution in the form of a model of nursing student clinical adaptation that has the potential to be replicated for future international professional practice programs.

This study is limited to the experiences of students practicing nursing at several healthcare institutions partnering with nursing education programs in Taichung City. The focus of the study does not extend to all cities in Taiwan, but rather only to the hospitals and institutions where students participate in formal practice. Furthermore, this study focuses on the COVID-19 pandemic and therefore does not address practice experiences before or after the pandemic. The variables analyzed included only academic experiences, clinical adaptation, interactions with Taiwanese healthcare professionals, and implementation of safety protocols during practice. The study did not examine institutional administrative aspects or comprehensive curriculum evaluation. This limitation was implemented to maintain a sharp and relevant focus, aiming to evaluate students' adaptation processes in the context of cross-border clinical practice during the pandemic.

4.   CONCLUSION

This study demonstrates that students' experiences practicing nursing during the COVID-19 pandemic in Taichung City were characterized by a strong clinical adaptation process, encompassing aspects of practical competency, understanding of safety protocols, and the ability to collaborate in a culturally diverse healthcare environment. Students faced challenges such as different workflows, documentation standards, and stricter professional demands compared to those in Indonesia. However, adaptation strategies such as familiarization with hospital information systems, strengthening clinical communication, and utilizing the support of preceptor instructors proved effective in helping them navigate the practice environment. These findings confirm that the study's objectives of describing practice experiences, identifying forms of clinical adaptation, and explaining the dynamics of professional learning in the Taiwanese healthcare context have been achieved through consistent and relevant results. Furthermore, this study demonstrates that international practice during the pandemic not only presents additional challenges but also provides opportunities to enhance students' capacity in terms of clinical flexibility, cross-cultural sensitivity, and future professional preparedness.

Future research is recommended to expand the number of participants and include cross-city or cross-country comparisons to obtain a more comprehensive picture of students' clinical adaptation in international practice.

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