



Research article

Perceptions and experiences of Generation Z nursing students during their practicum in an intensive care unit: A qualitative study

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ABSTRACT

Background: Influenced by socio-cultural and world events, Chinese society has significant intergenerational differences. With rapid economic and cultural development, the unique characteristics of Generation Z nursing students in China may influence the clinical education environment. However, the research on Generation Z in China is still in its infancy.

Objectives: This study aimed to explore the experiences and perceptions of Generation Z nursing students during their practicum in an intensive care unit (ICU) in the context of China's unique cultural and historical background.

Methods: A phenomenological approach was used in this qualitative study. Semi-structured, face-to-face interviews were conducted with fifteen Generation Z nursing students doing practicum in the ICU in a third-level hospital in Shanghai, China. The data were analyzed using Colaizzi's seven-step method.

Result: Three themes emerged: intelligent medical services empowering critical care, perception of multiple challenges, and affirmation of the teaching work in the ICU.

Conclusions and implications: The clinical instructors should use a combination of online and offline pedagogy, give positive guidance through role modeling, and develop the self-learning skills of Generation Z nursing students. This might help Generation Z nursing students relieve the stress of practicum in the ICU, more quickly adapt to the clinical environment, and enter nursing positions. The result of this research provided valuable information to help clinical practicum programs in China effectively educate Generation Z nursing students. Good education ensures that health care is safe and effective, making it easier for patients to get better.

1. Introduction

Individuals born after 1995 are often referred to as Generation Z (Gen Z) or the Pluralist Generation [1]. According to the National Bureau of Statistics, the current population of Gen Z in China is about 260 million, accounting for 19% of the total population [2]. They are entering higher education and moving into the nursing profession. Members of Gen Z are described as innovative, pragmatic,

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goal-oriented, thoughtful, adept at using technology, and requiring brief and timely feedback [3]. It is important to focus on the intergenerational characteristics of Gen Z because it affects the way they are educated and work in their nursing career.

Gen Z in China is influenced by unique sociocultural events and exhibits special characteristics. First, instead of the “helicopter parenting” of parents of Millennials [4], parents of Gen Z are more likely to adopt the “co-piloting parenting” and the “parental pendulum” styles [5], implying that parents often reflect on their parenting strategies and are more equal to their children. Traditional authoritative parent–child relationships are being reconfigured. Second, Gen Z, also known as the second-generation of China one (i.e., both parents are the first generation of only children), grew up in a “4-2-1” family (four grandparents, a husband and wife, and one child). They received more sophisticated educational resources than Baby Boomers, Generation X, and Millennials, who are also known in China as the “Lost Generation,” the “Lucky Generation,” the “Post 80s” [6] (Fig. 1). Meanwhile, Gen Z is more competitive due to intense academic competition (e.g., the senior high school entrance examination and the National College Entrance Examination) and strong expectations from elders. Finally, Gen Z was born entirely in a digital world, and the Internet came to China before they did. According to the 50th Statistical Report on China’s Internet Development, the number of Gen Z Internet users reached 30.7% in June 2022 [7]. The rich horizons brought by the Internet and the sense of competition under the rat race allowed Gen Z to be innovative. Further, the growth of Gen Z has been accompanied by major events such as the Beijing Olympics, the take-off of the Shenzhou spacecraft, and the World Exhibition. They have enjoyed the economic growth dividend due to reform and opening-up policies and are proud of their culture and country. As a result, Gen Z in China possesses personal traits (e.g., independence, versatility, competitiveness, and patriotism) and learning characteristics (technology-oriented and innovation).

As a practice-based profession, nursing education in China consists of two parts: college theoretical education and clinical practicum education. Clinical practicum education is the core of nursing education, allowing nursing students to acquire, perform, and improve nursing competencies [8]. According to the standards of undergraduate medical education in China, nursing students must complete all college courses and receive credit during their first 3 years of college. In their senior year, they are required to complete at least 40 weeks of clinical practicum at the teaching hospitals per the practicum syllabus, accounting for one fourth of the total hours of nursing education [9]. The practicum syllabus is usually developed by the faculty and clinical nursing experts based on the syllabus of the National Qualification Certificate for Nurse Practitioners and clinical job responsibilities. Following the requirements of the practicum syllabus, the nursing students must complete clinical rotations in major clinical departments such as internal medicine ward, surgical ward, obstetrics and gynecology department, pediatric ward, outpatient and emergency department, operating room, and intensive care unit (ICU). Among these, the ICU practicum is a necessary part of clinical practicum education, which usually ranges from 160 to 280 h in length, accounting for nearly 10% of the total clinical practicum time [8]. The intensive care unit, also called the intensive therapy unit or critical care unit, is a unit that provides advanced life support and treatment for critically ill patients with complex conditions [10]. With an aging population and the shock of coronavirus disease 2019 (COVID-19), the ICUs are playing an increasingly important role in medical care in China. The ICU practicum is a critical stage in the building of Gen Z nursing students’ capacity for critical care, such as specialty skills [e.g., mechanical ventilation, extracorporeal membrane oxygenation (ECMO), intra-aortic balloon counter-pulsation, continuous renal replacement therapy (CRRT), and blood purification], multidisciplinary collaboration, and critical thinking skills [11]. However, because of the presence of critically ill patients and stressful work environments, the experiences of nursing students during their practicum in the ICU differ from those in other clinical areas, which may pose risks to their physical and psychological well-being. These risks are caused by the physical environment (unfriendly lighting, visual and/or auditory alarms, awkward placement of equipment, overcrowding), the emotional environment (bad patient outcomes,

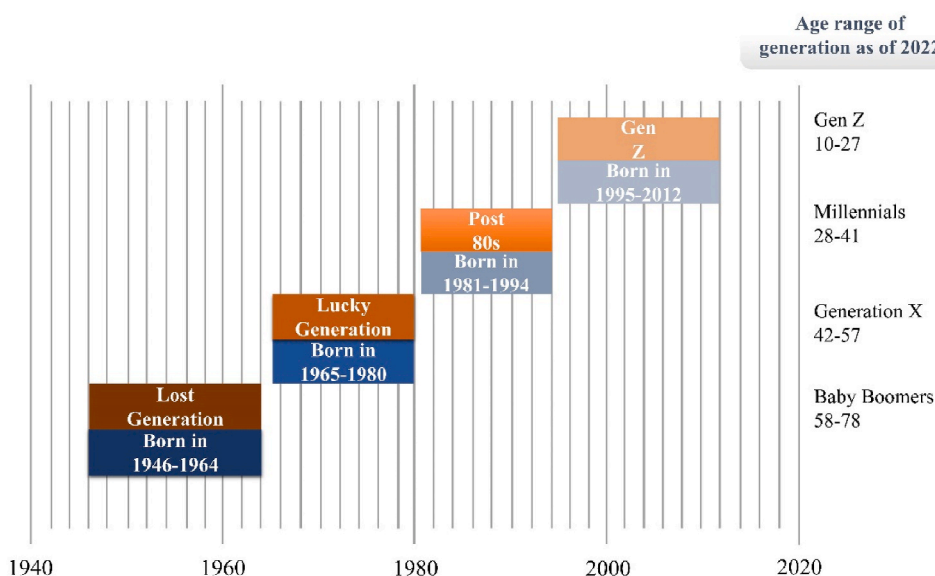


Fig. 1. Generational division.

regularly balance conflicting feelings, exposure to high levels of work intensity), and the professional environment (complicated multidisciplinary team, communication method, limited autonomy, management style) [12]. Further, resilience is defined as the ability to cope with adversity; to acquire resilience, one must first face adversity [13]. As mentioned earlier, the ICU is a fast-paced, demanding, and stressful environment, which is beneficial to nursing students developing problem-solving abilities and fostering resilience. Growing evidence shows that the ICU practicum is a cornerstone of nursing education and contributes to the acquisition of critical care skills for Gen Z nursing students and the sustainable development of the nursing discipline [8]. Gen Z nursing students and clinical instructors, as the main participants, are the determining factors in the quality of ICU practicum education.

The generational characteristics of Gen Z nursing students are challenging traditional clinical practicum education. Although previous studies have explored the experiences of nursing students during their practicum in the ICU [10,11,14], the voices of Gen Z nursing students in China have not been captured. Hence, this study aimed to explore the experiences and perceptions of Gen Z nursing students during their practicum in the ICU in the context of China's unique cultural and historical background.

2. Methods

2.1. Study design

A phenomenological approach is a form of qualitative research that analyzes the nature of phenomena by exploring the subjective experiences of individuals who have experienced them [15]. Therefore, a phenomenological approach was adopted in this study to investigate the real experiences and perceptions of Gen Z nursing students during their practicum in the ICU. The data were collected through semi-structured, face-to-face interviews and analyzed using Colaizzi's seven-step method. Colaizzi's seven-step method was utilized to extract valid and reliable new themes and interwoven relationships from rich data, which has proven to be rigorous and robust. The methodology provided researchers with clear, logical steps to explore and illuminate the experiences and perceptions of Gen Z nursing students during their practicum in the ICU [16].

2.2. Sample/participants

In this study, 15 Gen Z nursing students in the ICU of a third-level hospital in Shanghai were used as the study population. The inclusion criteria were as follows: (a) age 18–27 years; (b) 3 weeks or more of practicum experience in the ICU; and (c) Participants were free of psychological disorders, serious neurological and medical conditions (including pregnancy and breastfeeding), or learning disabilities, and could adequately express their emotional experiences through language. Many out-of-town colleges and universities have cancelled the opportunity for nursing students to come to Shanghai for practicum due to the influence of the COVID-19 epidemic. A total of seven institutions were involved in this interview: six universities in Shanghai (one undergraduate institution and five vocational colleges) and one undergraduate institution in Anhui. The participants' detailed characteristics are listed in Table 1.

2.3. Data collection

Semi-structured, face-to-face interviews were conducted in the months of October and November 2022. The interview questions listed in Table 2 were derived from previous studies [4,8]. The two co-authors were interviewed in Chinese, and each interview lasted 40–60 min. The audio-recording device was used to capture the interviews, and simultaneous note-taking was used as support. The interviews were concluded once the information data had been saturated and validated [17]. Each participant received a small gift (500 mL of juice) as a reward, and no one withdrew.

Table 1
Characteristics of the participants ($n = 15$).

Participant no.	Age (years)	Gender	ICU practicum (days)	Education level	Place of birth	Ethnicity	School location
1	21	Male	22	Baccalaureate degree	Shanghai	Han	Shanghai
2	21	Female	23	Baccalaureate degree	Zhejiang Province	Han	Shanghai
3	21	Female	24	Baccalaureate degree	Anhui Province	Han	Anhui province
4	21	Female	21	Baccalaureate degree	Shanghai	Han	Shanghai
5	20	Female	25	Diploma	Zhejiang Province	Han	Shanghai
6	20	Female	26	Diploma	Shanghai	Han	Shanghai
7	20	Female	22	Diploma	Shanghai	Han	Shanghai
8	20	Female	23	Diploma	Anhui Province	Han	Shanghai
9	20	Female	22	Diploma	Shanghai	Han	Shanghai
10	20	Female	22	Diploma	Shanghai	Han	Shanghai
11	20	Female	22	Diploma	Anhui Province	Han	Shanghai
12	20	Female	23	Diploma	Zhejiang Province	Han	Shanghai
13	20	Female	22	Diploma	Shanghai	Han	Shanghai
14	20	Female	24	Diploma	Shanghai	Han	Shanghai
15	20	Male	26	Diploma	Anhui Province	Han	Shanghai

Table 2
Interview questions.

Question no.	Question
1	What were your experiences and perceptions during your practicum in the ICU?
2	What was the hardest thing you had to deal with during your practicum in the ICU?
3	What was the most satisfying experience you had in the ICU?
4	How would you evaluate the current teaching work in the ICU?
5	What other experiences and feelings do you have?
6	What are your suggestions about the work of teaching in the ICU?

2.4. Ethical considerations

The Institutional Review Committee of Shanghai Tenth People's Hospital approved the study (No: 22KN08). All participants were informed about the study's purpose and voluntary nature, as well as the option to withdraw, and they then signed an informed consent form. The confidentiality was ensured by using numbers rather than real names (e.g., participant 1).

2.5. Data analysis

The data were transcribed verbatim from the recordings within 24 h after the interviews were completed. They were analyzed using the Colaizzi's seven-step framework [17] (Table 3).

2.6. Rigor

The criteria developed by Lincoln and Guba were used to ensure study rigor [18]. The researchers bracketed all their previous information and ideas as far as possible to avoid influencing and interfering with the study of this phenomenon. Several techniques were employed to increase dependability, including semi-structured interviews and note-taking, member checking, and peer checking. The confirmability was ensured through a clear description of the study context, sampling, and data collection and analysis processes. The final results were sent to all participants for confirmation and approval to increase credibility. The participants were selected based on maximum diversity and detailed descriptions of participant characteristics to meet transferability criteria. The Consolidated Criteria for Reporting Qualitative Research guidelines were implemented in this study to report methods and results in a structured and clearly understandable manner [19].

3. Results

Three themes were extracted: (a) intelligent medical services empowering critical care, (b) perception of multiple challenges, and (c) affirmation of the teaching work in the ICU. Three themes and nine subthemes are presented in Fig. 2.

3.1. Intelligent medical services empowering critical care

3.1.1. Work and learning efficiency are improved through human-machine interaction

The diversity, accuracy, and automation of the equipment in the ICU have increased with the increasing use of digital technology, network infrastructure, and automation systems in the medical field. All respondents stated that the human-machine interaction had enhanced the efficiency of critical care services. "I can now independently perform point-of-care testing, such as cardiac enzyme tests (smiled), and the data will be automatically uploaded to the hospital information system. I don't have to be busy to register the results because intelligent medical services empower critical care, which makes me feel very interesting" (Participant 10). "When instructors provide us with training, they post study materials on the application in advance so we can prepare independently, sign in electronically, and be evaluated" (Participant 15).

Table 3
Colaizzi's seven-step framework.

Question no.	Framework
1	Familiarization: The information was repeatedly and carefully read.
2	Identifying significant statements: Important and meaningful statements related to the research question were identified and extracted.
3	Formulating meanings: The recurring meaning statements were coded.
4	Clustering themes: The coded viewpoints were assembled, and meaningful common concepts were found and formed into thematic prototypes.
5	Developing a detailed description: The themes were described in detail in relation to the phenomena.
6	Producing the fundamental structure: Similar themes and their descriptions were repeatedly compared to identify the fundamental structure.
7	Verification: The results generated were returned to the participants for validation to ensure that their true experience was captured.

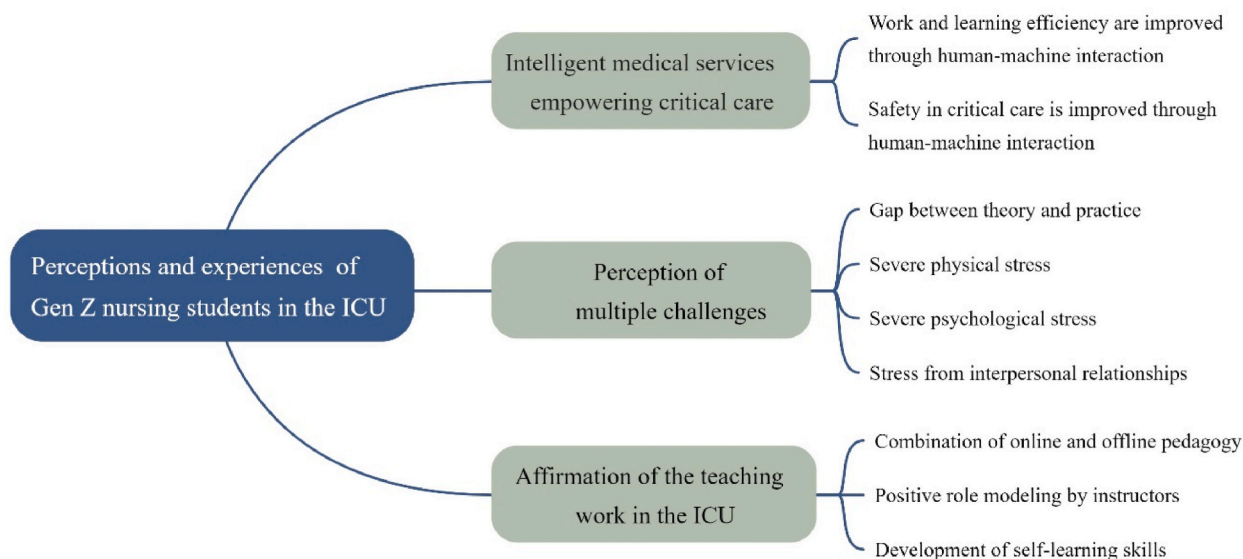


Fig. 2. Themes and subthemes.

3.1.2. Safety in critical care is improved through human-machine interaction

All respondents indicated that the human-machine interaction, such as mobile nurse workstations and precision instruments, improved the safety of critical care. “The system of nurse workstations includes many assessment modules, such as nutrition and pressure injuries. I attempted to receive new patients with my instructor. When the score exceeds the standard range, the system will issue a risk warning and suggest appropriate interventions to reduce unnecessary injuries” (Participant 13). “The infusion pump not only correctly maintains fluid rate and volume, but it also warns when fluids are done. This assists us in detecting anomalies and ensuring patient safety” (Participant 1).

3.2. Perception of multiple challenges

3.2.1. Gap between theory and practice

The gap between theoretical knowledge and ICU practicum is further increased by the high demands of specialized care and modern medical equipment in the ICU. Gen Z nursing students may be exposed to rare and highly specialized events in other practice settings. “I am like a kid in a candy store (smiled)! What I experienced during my ICU practicum was not only different from what I learned in school, but it was also completely different from other departments I had interned in” (Participant 2). “This is where I first learned about early activities, bed-bicycle exercises, and ECMO. There are some gaps between theory and practice, and it is difficult to cover this knowledge in school” (Participant 12).

3.2.2. Severe physical stress

A majority of respondents reported being under severe physical stress due to the large number of critically ill patients in the ICU and the intensity of nursing work. “There are a lot of nursing tasks to do every day. The burden is rather heavy, and I’m worried I’ll develop varicose veins” (Participant 5). “There are many critically ill patients in the ICU. And I do a lot of basic care work, such as oral care, with the instructor. My hands have eczema because I wear gloves all the time and use disinfectant frequently (frowned)” (Participant 4).

3.2.3. Severe psychological stress

Most of the respondents expressed that the patients in the ICU were critical and variable, and that the care work was associated with many uncontrollable high-risk factors, causing severe psychological stress. “I have been nervous all day because I am terrified of an unexpected cardiac arrest in one of my patients” (Participant 9). “I am concerned that the patient has an infectious disease, and that I will get infected (pouted) ...” (Participant 6). “When a 20-year-old man died of an abdominal aortic aneurysm, I felt immense agony and sadness. How life is so fragile (sighed)!” (Participant 11). “As soon as I hear the machine alarm go off, my blood freezes (frowned)” (Participant 14).

3.2.4. Stress from interpersonal relationships

The complexity of patient treatment needs and the specificity of multidisciplinary cooperation in the ICU make the nursing practicum more challenging for Gen Z nursing students. Some respondents expressed their frustration after the practices were rejected. “I just intended to replace the pressure ulcer dressing for the old grandfather, and he waved his hand in rejection (frowned)”

(Participant 7). “During the rescue, I felt like I couldn’t do anything. A doctor once scolded me loudly, which was especially painful (pouted)” (Participant 3).

3.3. Affirmation of the teaching work in the ICU

3.3.1. Combination of online and offline pedagogy

The developed online environment profoundly impacts the cognitive thinking, value shaping, and behavior development of Gen Z nursing students. All respondents expressed their affirmation of the combination of online and offline pedagogy, such as online video instruction, offline workshop teaching, and bedside teaching (BST).

Among online pedagogy, online video instruction is a form of multimedia teaching that has emerged with the increasing development of information technology, which is visual and infectious. “The instructor gave us online video instruction, such as on catheter care and CRRT. It’s a pretty effective way to learn in the context of the COVID-19 epidemic” (Participant 7).

In the field of education, the workshop is a form of learning in which small groups of learners come together to exchange ideas and share knowledge [20]. Most participants found the offline workshop teaching both interesting and meaningful. “I’ve had the pleasure of attending a team cardiac-pulmonary resuscitation (CPR) workshop, and it was a great learning experience (thumbed up!)” (Participant 3). “The instructor was showing us the Heimlich maneuver in the form of a sitcom, which was very immersive and impressive. I liked it so much!” (Participant 13). “Drawing arterial blood, suctioning, and catheterization were all demonstrated by the instructor. And I was given the opportunity to practice in a safe manner. In fact, I successfully drew arterial blood for the first time in the ICU (laughed). Thanks to the instructor!” (Participant 8).

3.3.2. Positive role modeling by instructors

Most respondents expressed that they had felt the positive influence of their instructors. “My instructor is a master’s degree recipient, and she frequently inspires me to conduct literature searches in the field of critical care to learn about the latest research advances, relevant guidelines, and evidence summaries; she is the leader of the way I grow up” (Participant 12).

Gen Z is willing to innovate under the guidance of their instructors and has a transformative mindset. Additionally, Gen Z is generally multi-talented and has access to quality educational resources. “I participated in my instructor’s patent application program on an intelligent first-aid transfer box. The instructor showed me step-by-step how to apply, and I used Photoshop drawing. We complemented each other’s strengths: the instructor had the creative inspiration, and I had the skills, which was very fulfilling. HaHa (laughed)” (Participant 1). “The instructors showed us the science videos they made themselves, and I’m going to make a vlog (video blog) of our ICU practicum. It is a memento of this experience and can also be shown to future students” (Participant 15).

3.3.3. Development of self-learning skills

Most of the respondents stated that the instructors were post-80s (Millennials) [21] and focused on the development of self-learning skills using online resources. “There is an old Chinese saying that the master teaches the trade, but the apprentice’s skill is self-made. For example, when learning about Intensive Care Unit-Acquired Weakness, we were asked to learn about etiology, assessment tools, risk factors, and interventions online, then our impression deepened” (Participant 7). “I also learned video editing in order to complete the sitcom video training, and I worked in a group to research and conceptualize the storyline during the scriptwriting, which stimulated my imagination and developed my skills (laughed)” (Participant 11).

The textbooks of universities in China are updated once every 5 years, such as the 14th Five-Year Plan textbooks of the People’s Medical Publishing House. The network resources in the information age are an effective supplement to the acquisition of knowledge in universities. “The instructor said that the acquisition of professional knowledge depends on personal initiative. Massive Open Online Courses (MOOC) and other online resources have cutting-edge knowledge not available in books” (Participant 6).

4. Discussion

The purpose of this study was to explore the experiences and perceptions of Gen Z nursing students during their practicum in an ICU in the context of China’s unique cultural and historical background. In this study of Gen Z nursing students, it was found that the ICU is a treatment unit with modern medical technology and equipment, and Gen Z appreciated that the intelligent medical services empowered critical care. Given this generation’s dependency on technology, instructors should evaluate how technology might be used to enhance ICU practicum instruction rather than replace practices entirely. Social platforms (e.g., WeChat, Facebook, and Twitter), e-learning materials (e.g., Kahn Academy and Crash Course), applications (e.g., Quizlet and StudyBlue), Internet-based games (e.g., Jeopardy, Kahoot, and Socratic), Internet learning activities (e.g., Coursera, MOOC, and YouTube), and interactive learning are effective teaching strategies [22,23]. Another positive implication is that higher-order skills across domains, such as innovative capabilities and technological strengths, can change and drive technological advances in critical care. The instructors should take full advantage of Gen Z’s ability to think outside the box and be tech-savvy, for example, by getting them involved in telemedicine and technology updates while also increasing their sense of accomplishment.

During their ICU practicum, Gen Z nursing students often perceive multiple challenges and stress, which can have a negative impact on their confidence and motivation to learn. The reason for this stress may include the complexity of the ICU patient’s condition and the fact that the instruments and equipment used in treatment in the ICU were not present in the previous learning (college theoretical education and clinical practicum education). Another reason may be the high workload and shortage of critical care nurses. Further, Gen Z nursing students encounter many unpredictable psychological stressors, such as sudden patient death and occupational

exposure. Furthermore, because of their reliance on technology, Gen Z nursing students lack face-to-face social skills with patients and health care providers. Notably, any one or a combination of the aforementioned factors may be a challenge for Gen Z nursing students in the ICU. Resilience has been shown to be an important component of managing stress and coping with challenges. A mindfulness program, Stress Management and Resiliency Training, and time management are some of the suggested trainings. Moreover, Gen Z nursing students prefer experiential learning. Consequently, trainings based on the experiences of highly resilient individuals, such as applying case scenarios and reflective practice, are highly beneficial in promoting resilience development [13].

This study found that using information technology to combine online and offline pedagogy was effective and meaningful. On the contrary, Gen Z in China was raised during a period of educational expansion; however, the passive cramming problem did not diminish as a result. Growing up in the context of an examination-oriented education system, Gen Z nursing students resent the information-dump approach and prefer an immersive, emotional, interactive, and game-based learning experience; also, they desire educators to positively understand their practicum needs and learning expectations [24]. Conversely, Gen Z nursing students not only need to acquire a variety of nursing practices, such as CPR and hemodynamic monitoring, but also need to develop critical thinking and multidisciplinary collaboration skills because of the high demands placed on critical care services. Moreover, the constant updates to technology in health care are making it more important for Gen Z nursing students to be able to learn on their own. The Chinese nursing development plan (2021–2025), which was issued by the Chinese National Healthcare Commission, emphasizes the need to cultivate comprehensive nursing staff who are skilled, sympathetic, creative, and resilient, and have a strong sense of professional belonging. Therefore, the traditional instructional methods no longer meet the learning needs of Gen Z nursing students in the ICU.

Considering the specific generational context, integrating the 5E learning cycle [25] into a combination of online and offline pedagogy can help Gen Z nursing students adapt to an ICU practicum: Increased Engagement; Encouraged Exploration; Detailed Explanation; Diverse Extension; and Timely Evaluation (Fig. 3). First, Gen Z prefers specific examples and visual feedback over reading text. The clinical instructors should give Gen Z nursing students brief activities (e.g., online video instruction, role plays, a gallery walk, and case studies) that build on what they already know [26]. This may get them more engaged in learning about critical care medicine. Second, the study found that Gen Z nursing students were innovative and willing to explore with the guidance of their instructors. The exploration phase can be centered on collaborative learning to develop multidisciplinary collaboration, self-learning, and critical thinking skills in Gen Z nursing students. Third, detailed explanations mean that nursing concepts and procedures are easy to understand. Offline workshop teaching and BST are both excellent options, besides increasing student engagement. The researchers [27] concluded that the “technical and artistic” workshop teaching provided a form of instruction that kept nursing students enthusiastic about learning while mastering concepts and procedures in a self-directed manner. Since the Gen Z attention span is now 6 min [5], the instructors should be careful to keep their interactions with Gen Z brief; lengthy meetings, lectures, and conversations can be ineffective with Gen Z. Again, Gen Z in China is described as a confident and versatile generation. Their talents should be expanded by diversity, as well as integration with nursing, which can increase their learning satisfaction and professional belonging. As described by participants, they applied their Photoshop skills and learned critical care knowledge to the patient application program and patient care. Finally, the instructors need to provide timely evaluation and constructive feedback in a diverse manner. Timely evaluation positively affects each phase of the 5E learning cycle. Further, empathy is the foundation for working with critically ill patients. The implementation of a social-emotional learning curriculum [28] is an effective action to develop professional awareness and empathy in Gen Z nursing students.

This study indicated that the positive role modeling of the clinical instructors helped foster the learning autonomy of the Gen Z nursing students and enhance their sense of belonging, which in turn facilitated their learning. Similar findings were confirmed in another study [4]. Gen Z respects racial, ethnic, and age diversity and is therefore likely to be able to relate well to instructors from

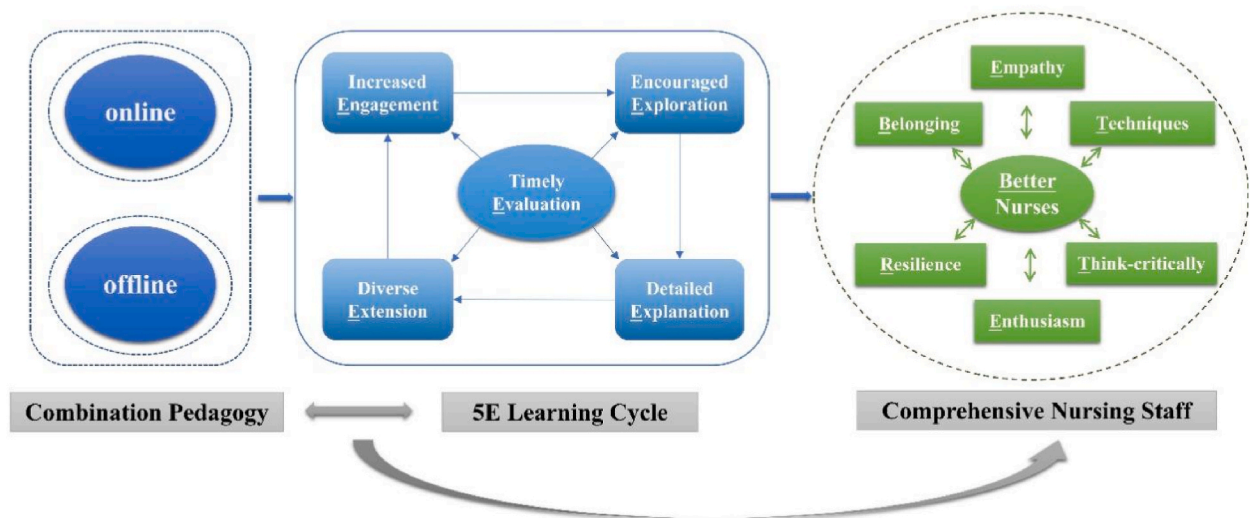


Fig. 3. 5E learning cycle.

different generations [1]. Unlike Generation X and Baby Boomers, who absolutely respect authority, Gen Z grew up in a “co-piloting parenting” style and has a closer relationship with their elders. Therefore, sound faculty–student relationships help Gen Z students grow up. However, influenced by Chinese Confucianism culture, the instructors are still respected and imitated by their students. The instructors should keep improving their skills and academic knowledge and instill positive attitudes in Gen Z nursing students.

5. Study implications

Because of personal traits and learning characteristics, the perceptions and experiences of Gen Z nursing students in China during their practicum in an ICU differ from other generations. This is the first qualitative study in China to investigate the experiences of Gen Z nursing students during their practicum in an ICU, which fills a research gap. The themes that emerged suggested that it is prudent for nurse educators to focus on the concerns of Gen Z nursing students. The findings of this research provided valuable information to help clinical practicum education in China effectively respond to the learning needs of Gen Z nursing students, promote their physical and psychological health, and maintain the stability of the nursing workforce, thus benefiting patient recovery.

6. Limitations

This study was conducted in a third-level hospital in Shanghai. Additionally, the hospital mainly enrolled Gen Z nursing students in an undergraduate institution and vocational colleges, but not secondary diploma nursing education students. Future studies should be conducted by collecting data from other teaching hospitals to further verify the findings of this research. Including a variety of disciplines in future studies is an additional suggestion. Nonetheless, this study might provide valuable information for clinical practicum education.

7. Conclusions

Unlike other generations, Gen Z nursing students have their own unique characteristics that influence education and work in nursing. Baby Boomers changed politics, Generation X changed families, Generation Y changed jobs, and Gen Z will change education, as well as clinical practicum education [1]. The clinical instructors should use a combination of online and offline pedagogy, give positive guidance through role modeling, and develop the self-learning skills of Gen Z nursing students. This might help Gen Z nursing students relieve the stress of practicum in the ICU, more quickly adapt to the clinical environment, and enter nursing positions. The results of this study are relevant to look at the future of clinical practicum programs and clinical instructor training.

CRedit authorship contribution statement

Jinxia Jiang: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Yue Liu:** Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Peng Han:** Conceptualization, Resources. **Jian Zhao:** Conceptualization, Resources. **Yan Shi:** Conceptualization, Formal analysis, Validation, Writing – review & editing. **Yugang Zhuang:** Conceptualization, Formal analysis, Validation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e26205>.

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