

Experience of Pediatric Nurses in Parent-Child Isolation Units of COVID-19 Designated Hospitals: A Qualitative Study

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Background: The omicron pandemic in Shanghai has created unprecedented challenges for pediatric medical institutions, and the work of pediatric nurses has changed rapidly due to the introduction of parent-child treatment. This study aimed to explore the experiences of pediatric nurses in the parent-child isolation unit of COVID-19-designated hospitals and provide a basis for developing feasible interventions as the next step.

Methods: Using phenomenological research methods, 12 nurses working in the parent-child isolation unit of Shanghai Children's Medical Center affiliated with Shanghai Jiao Tong University School of Medicine from April 1, 2022, to June 15, 2022, were selected by purposive sampling. Semi-structured interviews and data analysis were conducted using Colaizzi's 7-step analysis.

Results: Data analysis revealed three major themes and 11 subthemes. The main themes were "risk factors", "protection factors", and "resilience strategies". The sub-themes were "challenge of caring for both adults and children simultaneously", "lack of adult expertise leads to inadequate coping skills", "change in the care population increased communication difficulties", "physical and psychological distress", "social support", "social recognition", "awareness of responsibilities and roles", "team coming together", "hunger for knowledge", "health promotion", and "psychological adjustment strategies".

Conclusion: Hospital managers should optimize hospital management strategies, pay attention to multi-departmental and multi-disciplinary team cooperation, reduce the burden on pediatric nurses, improve the work and rest environment, mobilize the hospital support system, and maintain nurse's physical and mental health, establish a warm parent-child isolation unit encourages nurses to listen to the patients' voices and adopt diversified communication methods, and strengthen the publicity of the nursing profession, improve social support and recognition, and enhance the sense of self-worth and mission.

Keywords: pediatric nurse, COVID-19, parent-child unit, qualitative study

Introduction

Since the identification of Omicron in Africa in November 2021, Omicron variant infections have increased exponentially in many countries.¹ The sudden arrival of Omicron toward the end of February 2022 infected more than 620,000 people in Shanghai,² including more than 40,000 children under the age of 18 and more than 10,000 children under the age of 6.^{3,4} Faced with a large number of confirmed pediatric cases during the outbreak period, pediatric medical institutions face unprecedented challenges. It is necessary not only to ensure the basic safety of routine pediatric medical services and medical treatment under the situation of strict prevention and control but also to complete the admission of extraordinary pediatric cases under the condition of limited medical treatment and human resources. The government has taken strict control measures to prevent the spread of the epidemic. Children who are diagnosed and need to be isolated from their parents are unable to quickly adapt to the strange environment alone, especially in children with pre-existing

conditions, including asthma, neurological disorders, diabetes, obesity, and cardiac, hematological, and oncological disorders, these children are dependent on their parents for basic care and surrogate decision-making,⁵ separation from their parents causes loss of appetite, fear, anxiety, and inability to cooperate, which seriously affects the quality of life and could be particularly bad for disease recovery.^{6,7} In addition, parent-child separation during childhood can disrupt the ongoing attachment process with long-term adverse effects on mental health. However, parents who are unable to accompany their young children are concerned that local hospitals or collective medical observation centers will focus only on meeting the basic daily needs of their children and not on their psychological needs, leading to an increase in adverse parental psychological reactions and a range of social problems.^{8,9}

For the physical and mental health of children, and the adverse psychological reaction of their parents, patient and family-centered care (PFCC) has been an important part of pediatric care during the pandemic.¹⁰ Therefore, our hospital serves as a designated hospital, the isolation unit of our hospital adopts the mode of parent-child treatment, the infected child can be admitted to the isolation unit together with his father or mother (COVID-19-positive or COVID19-negative parents). Pediatric nurses are not only on the frontline of the disease, caring for children and their parents, but also shouldering the burden of the mental health pandemic for children and their families.¹¹ Owing to the lack of training and experience, nurses will have difficulty caring for people beyond their usual scope of work.¹² In the context of the omicron pandemic, facing the adversity of high risk of infection, high workload, and the changes in care recipients and work patterns, the physical and mental health of pediatric nurses are also facing great challenges.¹³

In recent years, resilience theory has often been used to explore how individuals face and overcome adversity. The concept of resilience refers to the ability of individuals to overcome adversity and thrive in high-risk environments. It has three core components: the risk factor, the protective factor, and the resilience strategy created by the interplay between the two.¹⁴ Most current studies have focused on work experiences of nurses in isolation units who must care for adults or children, and no attention has been paid to the real-world experiences of pediatric nurses in parent-child isolation units. Therefore, guided by the resilience theory, this study aims to explore the real experience of pediatric nurses to provide evidence to better support the work of parent-child isolation units and improve the ability of pediatric nurses to deal with major public health emergencies, and to provide a better quality of care to the people.

Methods

Setting and Participants

Purposive sampling was used to select nurses working in the parent-child isolation unit of Shanghai Children's Medical Center affiliated with Shanghai Jiao Tong University School of Medicine from April 1, 2022, to June 15, 2022. The inclusion criteria for this study were as follows: (1) volunteering to participate in this study and signing the informed consent form; (2) good language expression or communication skills; and (3) working in a parent-child isolation unit for more than two weeks. Nurses who were not employed in our hospital were excluded. Recruitment of participants continued until data saturation was reached and no additional information, including new issues/concepts, was uncovered. We ensured the representativeness of the respondents, samples were selected according to sex, age, job title, educational background, marital and childbearing status, and years of working experience.

Data Collection

Phenomenological research was used to interview nurses working in the parent-child isolation unit using a semi-structured interview approach. Following expert consultation and pre-interview testing, the final interview structure for the study was determined as follows: (1) You have to break out of your usual work routine to care for children and their parents in the parent-child isolation unit, and how is this different from your usual work? How do you feel about this? (2) What pressures and challenges have you encountered? How have you responded? (3) What has influenced your work experience in the parent-child isolation unit? (4) What are the most memorable things for a patient or colleague? (5) What help and support have you received? What kind of help and support would you like from hospitals and society? (6) Anything else you would like to add? During the WeChat video interview, we confirmed that the interviewees were in the rest area and observed and recorded their facial expressions, intonation, expressions,

movements, and other nonverbal behaviors through a combination of recording and notes. During the interviews, a neutral attitude was maintained; appropriate questions, repetitions, and clarifications were asked; interviewees were encouraged to fully express their feelings, and any form of prompting or induction was avoided. The interview time for each research subject ranged from 60 to 90 minutes. Thanks were expressed after the interviews, and the recordings were transcribed the same day.

Data Analysis

In this study, guided by resilience theory, NVivo 11.0 qualitative data analysis software was used to store and manage the transcribed text data, and the collected data were analyzed using Colaizzi's 7-step analysis method: (1) read all of the interview materials carefully; (2) extract meaningful content; (3) code recurring views; (4) collect coded views; (5) describe in as much detail as possible; (6) identify the common views and sublimate the theme; and (7) return the results to the research object for verification.

Rigor

The researchers underwent systematic training to master qualitative research methods and interviewing skills. After the interview, the recorded data were transcribed and translated into English by two bilingual researchers and returned to the research object for confirmation and to check the authenticity of the data. Two researchers read the data carefully and repeatedly, analyzed the same data, and wrote a reflective journal. In case of disagreement, they consulted peer experts, constantly compared the results with the original data, and made meaningful statements, after which a theme was formed. The results of the theme integration were returned to the research participants for confirmation to ensure the accuracy and objectivity of the data.

Ethical Considerations

This study was reviewed and approved by the Ethics Committee of Shanghai Children's Medical Center affiliated with Shanghai Jiao Tong University School of Medicine (Approval No.: SCMCIRB-K2022091-1). The researchers did not enter the parent-child isolation unit work, so they called to confirm the participation of the research object in advance and informed voluntary participants that this study takes the form of anonymity, on the premise of following the principle of confidentiality to interview recording, to obtain trust and informed consent, inform the purpose of the study, and determine the time in advance. They were also informed that they could withdraw from the study at any time.

Results

As shown in [Table 1](#). Twelve nurses working in the parent-child isolation unit were selected, aged 23–42 years, with different levels of education: three junior college, eight bachelor's degree, and one master's degree. The general characteristics of the study participants are shown in [Table 1](#).

Data analysis revealed three major themes and 11 subthemes. The main themes were “risk factors”, “protection factors”, and “resilience strategies”, along with 11 subthemes that emerged from the data, as shown in [Table 2](#).

Risk Factors for Pediatric Nurses Responding to COVID-19

Challenge of Caring for Both Adults and Children Simultaneously

Most pediatric nurses had no experience in caring for adults, and only one nurse had experience in caring for adults; none of them had any experience caring for both children and adults, and many felt incompetent in their roles. Pediatric nurses still needed to change their attitudes and practices to care for their typical patients as well as their parents. Wearing personal protective equipment (PPE), pediatric nurses are required to care for a new and additional population; they are playing a role to which they are not accustomed, and many pediatric nurses emphasized that this sudden transition was stressful and challenging, as they carried the burden of safety and preparedness.

I have never cared for both children and adults, not to mention in the situation of the epidemic flow, I am anxious, there are too many unknown things, and I cannot predict what kind of problems I will encounter. (Nurse#10)

Table 1 Demographic Characteristics of Nurses Interviewed

Variable	Category	Frequency
Age (years) Median:30 (range:24–42)		
	21–30	7
	31–40	4
	41–50	1
Gender		
	Male	3
	Female	9
Education		
	College degree	3
	Bachelor	8
	Master degree	1
Professional title		
	Nurse	3
	Senior nurse	6
	Nurse-in-charge	2
	Deputy chief	1
Marriage		
	Unmarried	5
	Married	7
With or without children		
	0	8
	1	3
	2	1
Work experience		
	≤5	6
	6–10	3
	>10	3

I am a low-seniority nurse, and due to epidemic prevention requirements, I not only need to face a new environment, new colleagues, and new work procedures, but also take care of children and adults, which is too difficult for me. I do not sleep well for several nights, and I feel I cannot cope with it. (Nurse#11)

The emergency will make me catch off guard, once I was taking the adult temperature, children are naughty, legs stuck in the bed bar, crying, tried various methods, and finally used lubricating oil; fortunately, the child was not injured. (Nurse#4)

Table 2 Main Summary Themes and Sub-Themes

Theme 1: Risk Factors for Pediatric Nurses Responding to COVID-19	Theme 2: Protection Factors for Pediatric Nurses Responding to COVID-19	Theme 3: Resilience Strategies for Pediatric Nurses Responding to COVID-19
1.1 Challenge of caring for both adults and children simultaneously	2.1 Social support	3.1 Team came together
1.2 Lack of adult expertise leads to inadequate coping skills	2.2 Social recognition	3.2 Hungry for knowledge
1.3 Change in care population increased communication difficulties	2.3 Awareness of responsibilities and roles	3.3 Health promotion
1.4 Physical and psychological distress		3.4 Psychological adjustment strategies

Lack of Adult Expertise Leads to Inadequate Coping Skills

Although we admitted relatively younger patients with fewer comorbidities to this unit in the parent-child isolation unit, the nurses still felt immense pressure because of their lack of knowledge about specialized adult care. Short-term training in adult care cannot compensate for the lack of long-term work experience and knowledge reserved for adult care, and training has provided only a minority with the ability to care for adult patients. Some adults also have other problems, such as mental health problems, that require the care of pediatric nurses and can lead to inadequate coping skills. Interdisciplinary care leads to inadequate coping skills in pediatric nurses.

There is a father who had orbital cellulitis and felt very uncomfortable, but this belongs to my knowledge shortcomings, there is no knowledge about ophthalmology in my training content, I can only comfort more, this situation really makes me very helpless. (Nurse#2)

There was one newborn baby whose mother was in the perinatal period, whose wounds had not yet healed, and whose mood was very low. Unfortunately, I have never taken care of the woman, and I do not know the next points of care; I want to give her the most professional care, but I do not know how to comfort her, which makes me feel very powerless (She shook his head and sighed). (Nurse#6)

Change in Care Population Increased Communication Difficulties

Although pediatric nurses need to communicate with their parents in their daily work, most adults in the parent-child isolation unit are infected with COVID-19. Under uncomfortable physical conditions, they are often very irritable, while some COVID-19-negative parents are very anxious because of their fear and infection. Many adults who accompany their children to the parent-child isolation unit are not their main caregivers, and the communication work of the pediatric nurses is helpless and tiring. Second, the nurses' use of PPE, nurses wearing PPE need to cover the face and ears and facial expressions, affecting sound transmission, damaging the ability of communication.

It is not easy for parents, they have fever, fatigue, and many other discomforts, but also worried about their children and took care of their children, the young father never took care of their children, broke down and cried, threw the children directly to the nurse and never listening to persuasion. Some parents who were not infected with COVID-19 were afraid infected and always thought that her protective materials and education were not in place. (Nurse#3)

Protective equipment influenced the transmission of sound, sometimes we cannot hear clearly, and caused misunderstanding with the patient. (Nurse#4)

Physical and Psychological Distress

Pediatric nurses working in the parent-child isolation unit are relatively inexperienced when they are confronted with adult patients and have to leave the family for isolation until the end of the job, quarantine in a designated place (not at home) for 14 days before going home, take care of other people's families, but are unable to take care of their own family and worry about not being able to play a family role. Under these circumstances, they experience psychological problems such as distress, anxiety, loneliness, and insomnia. In addition, wearing PPE for long periods arouses negative feelings in

pediatric nurses, which can cause headaches, dyspnea, sulkiness, and extreme fatigue. Masks can also leave marks on the eyes and face, which can cause facial pain. In addition, PPE makes nursing difficult, reduces the speed of nursing procedures, and makes communication more difficult.

Professional preparation for disinfection, interventions for patients' psychological problems, and documentation are all daily tasks; however, I am unfamiliar with them and have no systematic training. I sometimes feel anxious and lose sleep at night because of heavy daily work. (Nurse#5)

My parents are older and I fear they are infected, and neither of them has received the new coronavirus vaccine I am the only child at home, but I cannot take care of them (she shook her head, revealing helplessness in her eyes). (Nurse#9)

I am usually very busy when I work and my brain is full of patients. When the shift rests, I am only alone in the room. I miss my wife and children. My child is relatively small, and it is difficult to take care of her, but I cannot help at all. (Nurse#7)

In sealed protective clothing, which is very hot, the nose also has pressure sores, making everything even more difficult, particularly with venipuncture. It is difficult for me to recognize my colleagues at work and I often need to speak loud to hear their voices, which makes people tired and easy to make people irritable. (Nurse#3)

Protection Factors for Pediatric Nurses Responding to COVID-19

Social Support

After the outbreak, many other cities and provinces extended their helping hands, helping with human and material resources. Hospital managers do their best to provide support in all aspects, match young nurses with more experienced nurses, fix collocation, ensure the safety and quality of nursing, and reduce the psychological pressure on young nurses. Although colleagues in the isolation unit formed a new temporary team, they helped each other and forged revolutionary friendships. The understanding and support of the family and community make pediatric nurses feel warm and have no worries.

I was overwhelmed by the workload pressure in the isolation unit. Colleagues from surrounding cities came to support us, and I was moved (her eyes were moist). (Nurse#1)

My family is under closed-off management, and food and commodities are in short supply. Thanks to the supplies sent overnight by surrounding hospital, I was able to work easily. communities, and my neighbors will also take care of them. (Nurse#12)

Although supplies were tight, to enhance our resistance, hospital leaders still tried to inject us with thymic peptides. The head nurse was very concerned about my emotions and spoke to me. (Nurse#7)

I am a new nurse; venipuncture technology is my weakness, and PPE makes it even more difficult; I am very nervous and do not know what to do. Fortunately, the experienced teacher taught me hand-in-hand. Colleagues are humble about eating, resting, and leaving fresh fruit to others. (Nurse#6)

My parents usually dote on me very much and do not let me do anything, but they are very supportive of this time. My husband is also a healthcare worker, and we can all understand each other. Our parents help us take care of our children so that I can devote myself to it. (Nurse#3)

Social Recognition

At the time of the COVID-19 outbreak, nurses were known as "health defenders", and nurses were thanked by their patients and recognized by the community, which eased their fatigue from working in the isolation unit.

A child with blood disease in shock rescue, through multidisciplinary teamwork, was saved from the crisis, and family members sent a letter of thanks. I feel that all my efforts are worthwhile. (Nurse#1)

Seeing my hard work, many parents would take the initiative to assist us in undertaking childcare work; they understood and recognized my work, making it much easier. (Nurse#2)

There is a little girl who often expects me to work every day and make a heart shape with fingers through a glass door, making me feel needed and proud. (Nurse#8)

My neighbors knew that I was a nurse working in the isolation unit and that they would deliver food to my husband. I felt societal recognition for the first time. Regardless of how tired I am, I am relaxed. (Nurse#12)

Awareness of Responsibilities and Roles

All nurses who participated in the survey described their role in the parent-child isolation unit. Most of them believe that they are not only nurses, but should be friends, and even family members with the patients; they help not only the children to maintain physical and mental health, but also the parents to maintain physical and mental health. Changes in job responsibilities give pediatric nurses a stronger sense of responsibility and mission, while working in the parent-child isolation unit. Pediatric nurses often receive recognition from patients, such as warm words and thank-you letters, which makes the nurses feel proud because they realize the value of their work.

As a nurse in the Pediatric Intensive Care Unit (PICU), I am not very experienced, but I feel very valuable in facing the feeling of being needed. (Nurse#1)

I am very happy that I have worked in the parent-child isolation unit. As a male nurse, I have not been sure of my values, but through this experience, I have determined that this is a valuable job and worth fighting for all my life. (Nurse#2)

I am a healthcare worker, and I should stand up to protect the health of the people when the country and society need me. I told myself that this was my mission. (Nurse#3)

I take videos and photos to document our lives during COVID-19 and hope that my children will be proud that I am a nurse on the front line of the COVID-19 outbreak in the future. (Nurse#5)

Resilience Strategies for Pediatric Nurses Responding to COVID-19

Team Came Together

In caring for COVID-19 patients, different departments worked together as a new interprofessional team, and the pediatric nurses felt that they needed and received emotional and physical support from team members. They respect and rely on each other, communicate closely, and work hard together for a common goal.

When I feel physically unwell, my team friends will sacrifice their rest time and allow me to rest more, I am grateful. (Nurse#1)

Team members comfort each other, huddle together for warmth, and resist the negative emotions together. (Nurse#6)

Medical team cooperation is no stranger to me, but in the isolation unit, communication with doctors has improved and been enhanced. Doctors communicate very well and try to reduce our workload. (Nurse#2)

Hungry for Knowledge

Pediatric nurses use their rest time to improve their professional knowledge and skills about adult specialty care and COVID-19, often using the network and consulting colleagues from other specialties. In addition to professional knowledge, young nurses learn many communication skills and work attitudes from experienced nurses, and invisible knowledge is well passed on.

Working in the parent-child isolation unit, I need to take care of adults and children, which is beyond my usual work routine. I must master specialized adult knowledge as soon as possible to better observe disease changes in adult patients. (Nurse#8)

I will learn about COVID-19 carefully to protect myself from infection and avoid affecting my work progress. (Nurse#5)

During this period, I fought with colleagues from different departments and felt a sense of belonging. Many experienced colleagues' professional attitudes and abilities to deal with the nurse-patient relationship are worth learning. (Nurse#1)

Health Promotion

Pediatric nurses believe that health promotion is a form of self-care. Only when we take good care of ourselves and have a healthy body can we take better care of others. Frontline nurses need to be physically fit, need good nutrition and rest to cope with intense and stressful work, and need vitamins and supplements after caring for patients. They were concerned about becoming infected for other physical reasons that would affect teamwork or infect other team members. All participants were concerned about spreading the virus among their team members.

I try to maintain good health and ensure daily intake of milk and eggs to ensure the normal operation of the team work. (Nurse#3)

I take vitamin tablets and exercise at rest every day, believe I will not be infected, and there's no chance to spread the virus to team members. (Nurse#6)

Working in the isolation unit with high physical consumption and weight loss, I lost my physical energy and weight When I entered the unit to work. I must guarantee my nutritional intake I would try to ensure the intake of proteins and other nutrients when I have no appetite. (Nurse#4)

Psychological Adjustment Strategies

Pediatric nurses in parent-child isolation units often rely on self-regulation, facilitation, and moderate catharsis to relieve negative emotions. When communicating with patients, nurses cultivate empathy, choose to listen to others' voices, and understand others' feelings; they need to receive more respect and understanding from patients, forming a virtuous cycle, and the emotions can be improved.

My work in the isolation unit was under great pressure; therefore, I adjusted myself as soon as possible. I would like to draw on protective clothing and precious cartoons can set me up. (Nurse#6)

When I encounter problems, I think about how to solve them rather than complaining. Most of the time, I contact my friends via WeChat; they know me best, and I try to spend every day happy. (Nurse#9)

Parents complained to us because of physical discomfort, understood their needs, and found that they lacked knowledge. They taught them physical cooling methods, promoted comfort, and finally received their gratitude, my mood has also improved. (Nurse#4)

A mother in lactation always creates unreasonable demands. I communicated with her patiently and found that an amniotic fluid embolism had occurred at birth. I began to try to understand her, and my communication with her became very smooth, my mood has also improved. (Nurse#5)

Discussion

This study identified the risk factors, protective factors, and resilience strategies of pediatric nurses working in parent-child isolation units. When faced with a public health crisis, hospitals must be prepared to care for patients beyond their normal capacity. Among all healthcare professionals, nurses spend the most time caring for patients and working in close proximity; therefore, they need to be acquainted with the real-world experiences of pediatric nurses need to be understood to support frontline work and improve pediatric nurses' ability to cope with major public health emergencies.

Risk Factors for Pediatric Nurses Responding to COVID-19

This study found that pediatric nurses working in parent-child isolation units face great challenges. Parent-child units started from scratch and were temporarily transformed from pediatric units, and the hospital reorganized the clinical space to accommodate the surge in family patterns. Changes were required to the equipment, backup drugs, information systems, and workflow. Considering the harm caused by parent-child separation,¹⁵ the government has decided to treat parents and children together. This method provides clinical pediatric nurses with services beyond their scope, the familiar setting, routine, and nurse-patient relationship, which increases the difficulty of care.¹⁶ However, nurses are not omnipotent, and they would feel helpless in this situation and need strong support and help from hospital managers, optimized management strategies, and mobilized multidisciplinary teamwork from multiple departments to reduce the care burden of pediatric nurses, so as to better provide better care for patients. It is very important to establish good contact with the patients in the isolation unit, the pediatric nurses must wear personal protective equipment, keep their physical distance, and reduce their time in the unit, the provision of humanistic and holistic care would become fragmented.¹⁷ Therefore, when transforming the unit, using iPads and speakers in each room to connect with the family would make communication very smooth, and the information department needs to ensure a smooth network.¹⁸ The material support team provides parents and children with daily necessities and recreational activities (eg, books and games) so that they could feel loved.¹⁹ Pharmacy staff learn about adult doses, preparation, drug interactions and safety

profiles to provide security for nurses. Hospital laboratories were established to perform adult tests, and integrate cutoff values into electronic medical records to facilitate nurses' work.²⁰

Owing to limited time for preparation and education in adult care and comorbidities, pediatric nurses begin caring for adult patients while caring for pediatric patients, many pediatric nurses highlighted indicated this sudden change in responsibility was stressful and challenging. The adjustments to adult care remain difficult for nurses who have no previous experience, they had no systematic adult training, no exposure to similar tasks, and were not familiar with their operations, but also for nurses who have previously worked in adult patient care facilities.²¹ Managers enhance the knowledge and skills of adult care for their caregivers by providing temporary intensive training, and conducting continuous medical education and training to ensure that the nursing teams are fully prepared for addressing public health emergencies.²² Hospital leaders stay connected with nurses through a regular, transparent, multi-mode, and two-way communication mode, simplified the communication mode, conducted effective communication, and understood the needs of nurses.²³ Finally, the need for managers to actively promote employee welfare must be emphasized, it positively impacts their willingness to care for their patients.²⁴

This study found that communication was more difficult in parent-child isolation units, especially in adult patients. The reasons for this occurrence were related to the patient's physical and mental status and the nurses' use of PPE. Parents acted as both patients and guardians of the children this time, they needed to take care of their sick children and worry about their children when they were in physically uncomfortable, separated from the other parent, and unable to get support and company from their spouse.²⁵ Therefore, they experienced various emotional problems, including anxiety, depression, fear, and aggression.^{26,27} However, nurses wearing PPE need to cover the face and ears and facial expressions, affecting sound transmission, damaging the ability of non-verbal and verbal communication, and limiting the communication between nurses and children and adults.²⁸ Producing PPE that can penetrate the sound and make the lip movement visible, which may be a useful step in promoting communication between nurses and patients. To prevent infection and avoid long-term contact with patients, we can use the Internet and multimedia equipment to communicate and publicize, such as telephones, WeChat groups, translation software, and Application Service (APPS), to meet personalized needs. Children were encouraged to express their needs by drawing, and nurses communicated with them using cartoons and games. We can also use body language to communicate with patients, thumbing up for you are great, patting the shoulder for comfort, right-hand fist in front of the chest to indicate refueling, and heart gesture to express love. It not only warmed patients but also promoted communication and opened up a new mode of doctor-patient communication.

This study found that nurses working in parent-child isolation units had physical and psychological distress, including fatigue, pain, sleep disturbance, anxiety, depression, loneliness, and various stress, consistent with nurses' experience in previous infectious diseases epidemics, such as SARS, MERS-Cov, Ebola virus, and H1N1 influenza.²⁹ The rapid increase in the number of patients in the parent-child unit, increased working hours, workload, use of PPE, and shifts of nurses, and seriously affected the biological rhythm and work-life balance, causing stress, fatigue, headaches, sleep difficulties, and other psychological problems.³⁰ The fact that nurses need to switch between caring for two different groups, the identity of the parents has changed, both the patient and the caregivers of the children. Nurses were alone with them, adult patients' lack of psychosocial support from psychologists may further exacerbate the challenges for nurses.¹² They are unable to enjoy their relationships, and they feel lonely and sad to avoid touching, hugging, and talking normally with colleagues to avoid infection.³¹ The emotional hardship experienced throughout the pandemic was one of the most challenging aspects, affecting every nurse. Most participants felt that simultaneous care for children and adults in isolation units was more stressful and emotionally challenging than usual. At the same time, nurses are concerned about their health, colleagues, and families. Due to their strong sense of team responsibility, the concept of family in Chinese is deeply rooted, and nurses said they were more afraid of infecting their families rather than by themselves, and worried about the shortage of family living supplies.³² While nurses were resilient, care should not be all-inclusive. Nurses on the front line would take care of others, but they also need to take care of themselves.²¹ Pediatric nurses need a range of support and encouragement to ensure their adequate sleep and diet, such as providing a comfortable place to rest with food and supplies, shortening working hours through reasonable shifts, and allowing nurses to regain their strength and spirit by eating, bathing, and going to toilets during the rest period.³³ Various measures

were taken to help pediatric nurses to cope with this period, providing them with foods rich in protein and vitamins, and taking vitamin supplements and subcutaneous thymic peptides to increase body immunity.³⁴ Through financial support, the efforts of pediatric nurses should be compensated accordingly.³⁵

Protection Factors for Pediatric Nurses Responding to COVID-19

Since the outbreak of the COVID-19 epidemic in Wuhan at the end of 2019, nurses as health defenders have made important contributions on the front line of the fight against COVID-19. The country has rated eligible people who died from COVID-19 at work as martyrs.³⁶ In May 2020, on International Nurses Day, General Secretary Xi Jinping stated that nursing work is an important part of the health cause, the majority of nurses are the guardians of people's lives and health, the whole society should understand and support nurses, so pediatric nurses have received more recognition and support from the society in this COVID-19 outbreak.³⁷ During the child's hospitalization, parents developed a sense of compassion, recognition, and appreciation for the healthcare staff. In general, nurses need more social support during these outbreaks and also need public consciousness to encourage them.³⁸ Social recognition from neighbors, colleagues and peers could serve as a lifeline to eliminate this psychological stress.³⁹ Nurses thanked those who supported them, were moved by people online calling them heroes and sending rescue supplies, and gained strength from letters written by children.⁴⁰

In this COVID-19 outbreak, pediatric nurses face many difficulties based on the values of patriotism and dedication and the sense of mission to heal the wounded and rescue the dying, they still apply to join the battle, strive to perform their duties with high quality, show unity and professional dedication, and are proud that they can fight on the front line. Although working daily with a high load of work, the teamwork of nurses specifically powered them.⁴¹ Nurses would be proud and responsible to hear the people admit that nursing is difficult but admirable work. Nurses believed that their public perception of them had changed, and the nursing status in society had improved.⁴² Nursing workers had gained a sense of self-value and mission. Some nurses also said that they had learned new things from their experiences and professions, and discovered new career values. They thought these were the most precious gifts in their careers, and they were proud of doing this and felt stronger.⁴³ COVID-19 provides opportunities for professional care development, including love, honor, respect, support, gratitude to those around them, and good teamwork.⁴⁴

Resilience Strategies for Pediatric Nurses Responding to COVID-19

This study found that pediatric nurses from different specialties form a team to support each other emotionally and physically. Teamwork was not uncommon for pediatric nurses, but has improved with the outbreak of the pandemic. It was not just the teamwork between nurses, but also between nurses and doctors. LoGiudice et al, found that nurses rely on each other on emotional support and physical support under the pressure of the pandemic, many of them have emphasized the importance of teamwork to endure the pandemic.⁴¹ For most pediatric nurses, the teamwork is positive, adequate staffing and accountability of roles will better capitalize on the teamwork that nurses seek and develop during the pandemic, teamwork has facilitated the capacity of pediatric nurses to endure the COVID-19 pandemic.²¹ There are many well-meaning people who learn to identify differences in care background between new colleagues, and do their best to provide the most comprehensive care. We work together to meet the needs of patients in the parent-child isolation wards.³² Most of the interviewed nurses invested a certain time to study and expand their professional knowledge and skills about adult specialist nursing care and COVID-19 actively to improve the post competency. Jia et al, found that nurses would learn professional nursing skills, scientific research knowledge and management skills independently, thus improving the clinical decision-making ability, scientific research ability, coordination and cooperation ability to cope with the challenges of COVID-19 patient care.⁴⁵

Nurses had a heavy workload in the parent-child isolation ward, including comprehensive assessment and monitoring, rapid identification and response to clinical deterioration, communication and collaboration with physicians, symptom care, psychological support, and prevention of potential complications.⁴⁶ Therefore, nurses need to manage themselves physically and mentally well to provide quality care services for patients. Considering the team spirit, they were worried about being infected or for other physical reasons to affect the entire teamwork or infecting other team members. All participants felt afraid of spreading the virus to their team members. They adjusted their lifestyle and behaviors to cope

with the virus and the high load of work, and chose to strengthen their diet and physical exercise to enhance their immunity.¹⁷ Although the hospital provided psychological counseling services for pediatric nurses, few nurses knew and used them. Nurses thought that psychological problems felt unappreciated as a stigma, did not want to be known by others, and had their own coping methods. They regulated emotions and relieved stress by reading, jumping, keeping diaries, relieving mindfulness stress, and listening to music, which are all non-pharmacological interventions that are beneficial for mental health.⁴⁷ Managers should provide information, education, and material support for the self-care of pediatric nurses, such as purchasing books, exercising equipment, sharing stress relief articles, and decompressed toys. In addition, team support could be sought, and teamwork and mutual support are essential for improving the mental state when in trouble. Nurses who had the experience fighting COVID-19 need to share their experiences of similar crises with younger and less-experienced colleagues to help them gain a broader perspective.⁴⁸ Established an anonymous psychological counseling platform and emotional catharsis website for nurses may be more popular with nurses.²⁵ Managers should care for the nurses' families and encourage their family members and friends to communicate through social media networks with nurses, such as WeChat video chats, as they are usually able to understand the nurse, and their persuasion and comfort are effective.

Limitations

First, the participants were limited to pediatric nurses in a specialized pediatric hospital; therefore, the generalizability of our findings is limited. Second, during the Omicron pandemic, respondents and interviewers were unable to communicate face-to-face. Therefore, interviews were conducted online via video, which may have limited our insight into the situation. The next step is to conduct quantitative research to further verify these influencing factors and construct a precise intervention program.

Conclusion

The experiences of the pediatric nurses in this study indicated that the risk factors for pediatric nurses in the parent-child isolation unit included the challenge of caring for both adults and children simultaneously, lack of adult expertise leading to inadequate coping skills, increased difficulty in nurse-patient communication, and their own physical and psychological problems. Protective factors included social support, recognition, roles, and responsibilities. Resilience strategies include teamwork, a hunger for knowledge, health promotion, and mindset adjustments. Among all healthcare professionals, nurses spend the most time caring for patients; therefore, it is necessary to understand the real experiences of nurses working in parent-child isolation units, which can help healthcare decision-makers take appropriate measures to reduce nurses' workload, enhance communication skills, maintain nurses' physical and mental health, improve social support and recognition, enhance nurses' sense of self-worth and mission, ensure nurses work effectively and safely, and promote the quality of care. At present, with the adjustment of the Chinese government's epidemic prevention policy, large-scale COVID-19 infections have appeared in many domestic cities, which can serve as a reference.

Ethical Approval

This study was reviewed and approved by Ethics Committee of Shanghai Children's Medical Center affiliated with Shanghai Jiao Tong University School of Medicine (SCMCIRB- K2022091-1). All the participants signed a consent form to participate in the study, including that the anonymized responses could be used for publication.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

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