

# Assessment of the challenges and adaptation strategies of pediatric nurses in charge of caring for children with COVID-19.

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## Abstract

**Background:** Coronavirus Disease 2019 (COVID-19) is a pandemic cause severe acute respiratory syndrome. It is a major public health crisis threatening humanity since world war two.

**Aim:** This study aimed to assess challenges and adaptation strategies of pediatric nurses in charge of caring for children with COVID-19.

**Methodology:** A descriptive research design was used to conduct this study. **Setting:** This study was carried out at pediatric hospital affiliated to Fayoum university hospitals. A purposive sample of 100 nurses who providing care for children with COVID-19 in the previous mentioned setting. A structured interview questionnaire sheet consisted of four parts were used for data collection: **Part (1):** Assess characteristics of studied sample; **Part (2):** Assess pediatric nurses' knowledge regarding caring for children with COVID-19; **Part (3):** Challenges that faced pediatric nurses in caring of children with COVID-19; **Part (4):** Adaptation strategies used by pediatric nurses to face of COVID-19 of children.

**Results:** The results showed that 55% of the studied nurses had unsatisfactory knowledge level of caring for children with COVID-19. Regarding total challenges 75% of studied nurses had psychological challenges and 65% of the studied nurses had high working pressure. Also, regard adaptation strategy 60%, 55% and 51% of the studied nurses not used cognitive and educational adaptation, psychological and emotional adaptation and physical adaptation respectively.

**Conclusion:** The present study concluded that, there was highly statistically significant between total challenges of COVID-19 and total adaptation strategies among pediatric nurses in charge of caring for children with COVID-19.

**Recommendations:** Continuous training program for pediatric nurses to improve using of the adaptation strategies of caring for children during the COVID-19.

**Keywords:** COVID-19, Children, Nursing, Challenge, Adaptation strategies.

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## Introduction

Coronavirus Disease 2019 (COVID-19) was a pandemic lead to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). It was a major public health crisis threatening humanity. Which affected and threatened the lives of infected children's [1], in addition to, this virus presented an immediate danger to the functioning of communities across the world. That led to impacts as the loss of jobs, it affected the families and changes in the mode of education [2].

Children with COVID-19 presented with mild to moderate respiratory illness and recover without requiring special treatment and older teenagers increased risk for severe disease. However, some of them become seriously ill and required medical attention [3]. In some cases the virus develops to severe disease and children suffering from a post-infectious

multisystem hyper inflammatory syndrome named Multisystem Inflammatory Syndrome in Children (MIS-C) [4].

Uncontrollable nature of COVID-19 with the relatively high rate of infection and mortality among Health Care Providers (HCPs) provoked psychological disturbance and feelings of anxiety, stress, depression and psychosomatic symptoms, which lead to ethical dilemma at work, absenteeism, apathy, poor work performance and dissatisfaction, that caused deterioration of the quality of care provided by the affected staff with resulting poor outcomes of child care [5]. Pediatric nurses in COVID-19 crisis were faced many challenges result of directly involved in children's care as the limited clinical knowledge of the new COVID-19 virus and training to deal with and treat confirmed and suspected children with proper protective measures and precautions. In addition to, lack of

protective equipment, fear of transmitting the infection to others, lack of supportive work environment and social stigma [6].

Adaptation strategies used by pediatric nurses to overcome these problems and challenge, they used protective measures, stander precautions to limit infection and seeking of psychological support. As well as, searching in internet for knowledge related to COVID-19 treatment and prognosis [7]. In addition to, performing religious spiritual activities, strengthening their sense of self-worth and self-control to help them respond positively to the COVID-19 pandemic [8].

The pediatric nurses played vital role on providing comprehensive quality care to the healthy or sick children and accompanying him/her in the healing and rehabilitation process and if necessary at the time of death. Also, they emphasized of the administration of work areas, education of new professionals, individual, family and community. As well as, participate in researches as a fundamental axis of change from scientific evidence with statistics that prove it, providing care in an organized, practical and scientific manner [9].

### ***Significance of the study***

The COVID-19 virus has led to a global pandemic, that effect of the health system in the world and has negatively interfered with nurses' physical and mental health. Pediatric nurses have high exposure to the virus because their work involves direct care to children, on average, 6% of all confirmed cases of COVID-19 are among healthcare workers, that until 2020 at least 90,000 healthcare workers have been infected by COVID-19 and more than 260 nurses have lost their lives to the pandemic [10].

Pediatric nurses experienced many challenges as high workload, lack of Personal Protective Equipment (PPE) and specific medications, in addition to the feeling of inadequate support and suffer from stigmatization. Although of these challenge pediatric nurses decided to overcome and use adaptation strategy as use of protective measure, infection control practices and updated this knowledge regarding virus and seeking of psychological support [11]. So that, from researcher point of view it is important to assess of the challenges and adaptation strategies of pediatric nurses in charge of caring for children with COVID-19.

### ***Aim of the study***

This study aimed to assess the challenges and adaptation strategies of pediatric nurses in charge of caring for children with COVID-19 [12].

**Research questions:** The following research questions were formulated to fulfill the aim of this study:

- What are the challenges facing the pediatric nurses in charge of caring for children with COVID-19?
- What adaptation strategies are used by pediatric nurses to overcome these challenges?

## **Methodology**

### ***Technical design***

The technical design includes research design, setting, subject and tools for data collection.

### ***Study design***

A descriptive research design was utilized to achieve the aim of the study.

### ***Study setting***

This study was conducted in the pediatric hospital affiliated to Fayoum university hospitals.

### ***Study subjects***

A purposive sample of pediatric nurses who provide care of children with COVID-19 at the previously mentioned setting [13].

**Inclusion criteria:** The study included all available pediatric nurses who providing care for children with COVID-19 during time of data collection, regardless their age, gender, educational level and years of experience at least one year were recruited for participation in the study.

### ***Tools of data collection***

The following tools were used for data collection:

**Tool I: Interviewing questionnaire sheet:** It was designed by the researcher in simple Arabic language, after reviewing the related literature and references Erfani, et al. [14]. After reviewing from the researcher supervisors, to suit the level of understanding of the studied pediatric nurses and served to assess the following:

**Part 1:** Characteristics of the studied pediatric nurses, included age, gender, marital status, educational qualifications, years of experience at hospital, attendance of educational courses about COVID-19, working hours and number of shifts (monthly).

**Part 2:** Pediatric nurses' knowledge regarding COVID-19 in children, included definition of COVID-19, causes, incubation period, symptoms, mode of transmission, dangers age group in children, diagnosis, dangerous signs, treatment, prevention and role of nurses towards isolating children infected with COVID-19 [15].

**Scoring system:** According to pediatric nurses' answers, a scoring system was followed to obtain the outcome of the pediatric nurses' knowledge, where each question had 1 score for correct answer and incorrect answer with zero score. The total number of questions was 12 questions with total score of the knowledge 12 grades (equal 100%) [16].

The studied pediatric nurses' answers were checked using a model key answer and accordingly their knowledge was categorized into either satisfactory knowledge score 9-12 or unsatisfactory knowledge score less than 9 grades [17].

Total score were categorized into:

- Satisfactory ( $\geq 70\%$ ).
- Unsatisfactory ( $<70\%$ ).

**Part 3:** Challenges that faced pediatric nurses in caring of children with COVID-19.

It was designed by the researcher in the light of related references Irandoost, et al. and Alajmi, et al. [1,3] to assess challenges that faced pediatric nurses.

The scale included of 47 item grouped into 7 subscales. These are namely: lack of personal protective equipment (5 items), problem related to use of PPE (5 items), high working pressure (5 items), physical problems (8 items), psychological problems (11 items), lack of hospital support (7 items) and societal burden (6 items) [18,19].

*Scoring system:* For each challenges scale using (always=3, sometime=2, never=1) the total score of challenges was 47 point. Score of less than 60% ( $<85$ ) was never. The score between 60% to  $<75\%$  (85 to  $<106$ ) was sometime and the score equal or more than 75% (106-141) was Always.

**Part 4:** Adaptation strategies used by pediatric nurses to face of COVID-19 of children. This tool was designed by the researcher in the light or related references Huang, et al. [18] and to assess adaptation strategy used by pediatric nurses.

The scale included 35 item grouped into 5 subscales. These are namely: physical adaptation (9 items), psychological and

Items	Alpha Cronbach
Total knowledge	0.856
Total challenges of pediatric	0.795
Total adaptation strategy	0.822

**Table 1.** Alpha Cronbach reliability analysis of the used tool.

emotional adaptation (7 items), and social adaptation (8 items), cognitive and educational adaptation (7 items) and spiritual adaptation (4 items) [20,21].

*Scoring system:* For adaptation strategy scale using (always=3, sometime=2, never=1) the total score of adaptation strategy was 35 point. Score of less than 60% ( $<63$ ) was never. The score between 60% to  $<75\%$  (63 to  $<79$ ) was sometime and the score equal or more than 75% (79-105) was always.

### Tool validity

The content validity of the tool was reviewed by 3 experts from faculty of nursing Helwan university, Ain-shams university and Fayoum university (3 experts specialized in pediatrics health nursing) to test the content validity of the tools for clarity, relevance, comprehensiveness, understanding and applicability. Minor modifications of the tools were done according to the expert's comments on clarity of sentences, appropriateness of content and sequences of items.

### Tool reliability

This Table 1 show reliability in knowledge, challenges of pediatric nurses and adaptation strategy when Alpha Cronbach was  $>0.5$ . The reliability was scaled as follows:  $<0.25$  weak reliability, 0.25-0.75 moderate reliability, 0.75- $<1$  strong reliability and 1 is optimum. The reliability for this questionnaire was 0.82.

### Operational design

The operational design includes: the preparatory phase, content validity, pilot study, ethical considerations and field work.

### Preparatory phase

This phase included reviewing of related literature relevant to the research problem and the theoretical knowledge of the study using articles, periodicals, magazines, books and websites to get a clear picture of all aspects related to the research problem, as well as to develop the study tools for data collection.

### Pilot study

A pilot study was carried out on 10 nurses who represented 10% of the total study sample based on sample criteria to test the clarity, applicability and understand ability of the tool. Little modification was done as replacing and arrangements of some items. The involved nurses of the pilot study were excluded later from the main study sample.

### Field work

Once permission was granted to proceed with the study, the researcher visited the study setting. The actual field work was carried out for data collection over 6 months started from (February, 2022) to the end of (July, 2022). The researcher was available two days/week by the rotation in the previously mentioned study setting during the morning shifts from 9 am to 12 pm, the purpose of the study was explained by the researcher to each nurse providing care for children with COVID-19 before data collection in addition to clear and brief idea about aim of the study and its expectation. The average time needed for completion of each questionnaire sheet by nurses was approximately 20-30 minutes, the investigator taken 4 nurses each week consisting about 16 nurses per month and total number of nurses equals 100 nurses.

### Administrative design

After explanation of the study aim and objectives, an official

permission was obtained from the dean of faculty of nursing, Helwan University and the director of previously mentioned hospital and asking for cooperation and permission to conduct the study.

### Statistical design

Upon completion of data collection, data was organized, categorized, tabulated, entered and analyzed using Statistical Package for the Social Science (SPSS), IBM SPSS statistics for windows and version 20.0. Armonk, NY: IBM Corp. Data were presented using descriptive statistics in the form of frequencies and percentages. Chi-square tests were used to compare frequencies and correlation between study variables.

### Probability (P-value)

P-value>0.05 was considered insignificant. P-value<0.05 was

considered significant. P-value<0.001 was considered as highly significant.

### Results

In Table 2 presented nurses' characteristics. It showed that about more than two thirds of the studied nurses (72%) were in the age group of 20<30 years with ( $\bar{X} \pm SD = 28.19 \pm 5.34$  years). The majority of them (88%) were females; more than half of them (57%) were technical nursing institute. More than two thirds of them (70%) did not attend any previous educational courses about COVID-19.

In Table 3 illustrated that regarding total challenges of COVID-19, 70% studied nurses reported always had psychological challenges, 65% of them sometime had high work pressure. While 41% of them reported never had problem related to use of PPE.

Nurses' characteristics	N	%
<b>Age (years)</b>		
20: <30	72	72
30: <40	22	22
40: ≤ 50	6	6
Mean ± SD	28.19 ± 5.34	
<b>Gender</b>		
Male	12	12
Female	88	88
<b>Education qualifications</b>		
Secondary nursing school	15	15
Technical nursing institute	57	57
Bachelor of nursing sciences	28	28
<b>Previous educational courses about the COVID-19</b>		
Yes	30	30
No	70	70

**Table 2.** Number and percentage distribution of the studied nurses according to their characteristics (n=100).

Total challenges	Always		Sometime	Never		
	N	%	N	%	N	%
Lack of personal protective equipment	19	19	41	41	40	40
Problem related to use of PPE	24	24	35	35	41	41
High working pressure	30	30	65	65	5	5
Physical challenges	25	25	46	46	29	29

Psychological challenges	75	75	17	17	8	8
Lack of hospital support	60	60	23	23	17	17
Societal burden	35	35	41	41	24	24

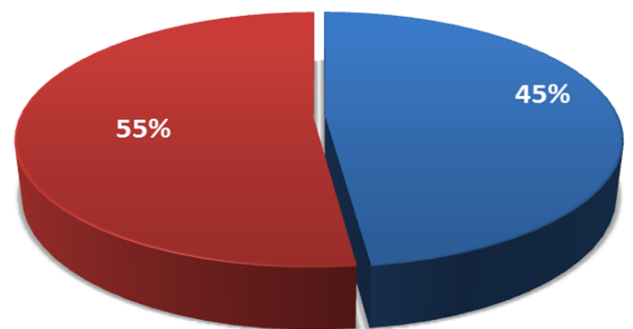
**Table 3.** Number and percentage distribution of the studied nurses' regarding total challenges in caring of children with COVID-19 (n=100).

In Table 4 revealed that regarding total adaptation strategy, the most of studied nurses (93%) reported always had spiritual adaptation and 45% of them had sometime social adaptation. While more than half of them (60%), (55%), (51%) reported never had cognitive and educational adaptation, psychological and emotional adaptation and physical adaptation respectively.

In Table 5 showed that, there was highly statistically significant with negative correlation between total challenges of pediatric and total knowledge when P-value<0.001\*. Also, there was highly statistically significant with negative correlation between total challenges of pediatric and total adaptation strategy when P-value<0.001\*. While there was highly statistically significant with positive correlation between total knowledge and total adaptation strategy was P-value<0.001\*.

In Figure 1 revealed that, more than half of the studied nurses (55%) had unsatisfactory total level of knowledge regarding

caring of children with COVID-19, while less than half (45%) of them had satisfactory total level of knowledge.



**Figure 1.** Number and percentage distribution of the studied nurses according to their total level of knowledge regarding caring of children with COVID-19 (n=100).

Total adaptation strategy	Always		Sometime		Never	
	N	%	N	%	N	%
Physical adaptation	33	33	16	16	51	51
Psychological and emotional adaptation	30	30	15	15	55	55
Social adaptation	43	43	45	45	12	12
Cognitive and educational adaptation	30	30	10	10	60	60
Spiritual adaptation	93	93	6	6	1	1

**Table 4.** Number and percentage distribution of the studied nurses' regarding total adaptation strategy in caring of children with COVID-19 (n=100).

	Total knowledge score		Total challenges of pediatric nurses score	
	r	P-value	R	P-value
Total challenges of pediatric nurses score	-0.529	<0.001*		
Total adaptation strategy score	0.394	<0.001*	-0.555	<0.001*

**Note:** \* Significant with positive/negative correlation between total knowledge and total adaptation strategy

**Table 5.** Correlation between total knowledge, total challenges of pediatric nurses and total adaptation strategy scores.

## Discussion

Coronavirus Disease 2019 (COVID-19) is a pandemic caused severe acute respiratory syndrome coronavirus 2; it considered the cause of a dangerous illness that affects children health. During the pandemic nurses are on the frontline and are responsible for providing holistic care to the children, they faced many challenge as high work pressure, lack of PPE, physical and psychological challenge, problem related to use of PPE, lack of hospital support, societal burden. Nurses have taken some adaptation strategies to overcome these challenge as physical, psychological, emotional, social, cognitive, educational and spiritual adaptation [22]. From researcher point of view it is important to assess of the challenges and adaptation strategies of pediatric nurses in charge of caring for children with COVID-19.

Regarding the characteristics of the studied nurses, the results of the present study showed that, more than two thirds of the studied nurses were in the age group 20-30 years old, where mean  $\pm$  SD was  $28.19 \pm 5.34$  years. These findings are in agreement to the findings of Akkuş et al. [2] who carried out a study entitled "Experiences of nurses working with COVID-19 patients: A qualitative study in Turkey" and found that more than half of the nurses were in age group between 20 and 30 years old. From researcher point of view

As regards nurses' genders the results of the current study illustrated that, the majority of the studied nurses were females. This findings are consistent with Catania et al. [9] who carried out a study entitled, "Lessons from Italian front-line nurses' experiences during the COVID-19 pandemic: A qualitative descriptive study in Italy" and reported that the majority of nurses were female. From researcher point of view the female nurses caring of children in hospital more than male.

Concerning educational qualifications, it was observed in the present study that, more than half of nurses had technical institute of nursing and the minority of bachelor of nursing sciences. This finding was in agreement with the finding of Hastuti, et al. [17] who studied "The role of pediatric nurses in caring for children with COVID-19 in Indonesia", and found more than half of nurses caring for children with COVID-19 had technical institute of nursing. From researcher point of view the fact that technical nursing institutes provided the community with large number of graduates than other agencies such as faculties of nursing.

Regarding the nurses' attendance of previous educational courses about the COVID-19, it was found that two third of them did not attend any previous educational courses about the COVID-19. The finding of the present study was similar to the findings of Dewart, et al. [12] who conducted a study entitled "Nursing education in a pandemic: Academic challenges in response to COVID-19 in Canada" the majority of nurses don't attend previous educational courses about the COVID-19. From researcher point of view these finding shed the light about importance of regular trainings and educational courses, so as to ensure that healthcare personnel deliver the latest evidence-based care especially among the junior staff nurses.

Considering total challenges of COVID-19 among nurses the finding of the present study showed that, three quarters of the nurses had psychological challenges; this finding was supported by Que, et al. [26] who studied "Psychological impact of the COVID-19 pandemic on healthcare workers: A cross-sectional study in China", reported that more than half of the nurses suffered from psychological problem. From researcher point of view during COVID-19 pandemic nurses worked long time in isolation units without rest and suffered from lack of hospital support.

Regarding total level of adaptation strategies of the studied nurses, the findings of the current study revealed that more than half of them not used psychological and emotional adaptation strategies. The current study findings came in the same line with those of Kim, et al. [22] entitled "Nurses' adaptations in caring for COVID-19 patients: A grounded theory study in Korea" where more than half of the studied nurses not used psychological adaptation strategies in COVID-19 pandemic. On the other hand, the study findings of Chen et al. [10] disagrees with the current study finding, who conducted a study entitled "Guidance to support nurses' psychological well-being during COVID-19 crisis in England" and found that the majority of nurses seeking of guidance and support to psychological well-being and adaptation.

Also, the finding of the present study showed that more than half of the studied nurses not used cognitive and educational adaptation this finding in agreement with Alsafi, et al. [4] who found more half of nurses had problem in educational adaptation. From researcher point of view result of lack of educational courses about COVID-19 to help nurses to use cognitive and educational adaptation effectively.

Regarding correlation between total knowledge, total challenges and total adaptation strategy of nurses the study finding showed that, there were highly statistically significant differences with negative correlation between total challenges and total knowledge, also between total challenges and total adaptation strategy. This result is accordance with Ahmadi, et al. [1] who conducted a study entitled " Explaining experiences, challenges and adaptation strategies in COVID-19 patients: A qualitative study in Iran" found that there was negative correlation between total challenge and total adaptation strategy. From the researcher point of view, the nurse was with the greater challenges during COVID-19 pandemic they less used adaptation strategy. However, this study finding cleared that, there was highly statistically significant with positive correlation between total knowledge and total adaptation strategy. This result goes in the same line with Dayılar, et al. [11] who studied "Roy adaptation model: Theory-based knowledge and nursing care with a person experiencing COVID-19" found that, there was positive correlation between total knowledge and total adaptation strategy. From the researcher point of view, the nurses with unsatisfactory knowledge level less used adaptation strategy.

On assessing nurses' knowledge regarding caring of children with COVID-19, the current study showed that, more than half

of the studied nurses had unsatisfactory knowledge. This might be due to they don't attend previous educational courses about the COVID-19. These result in agreement with Bhagavathula, et al. [7] who studied "Knowledge and perceptions of COVID-19 among health care workers: Cross-sectional study in Abu Dhabi" who reported that majority of nurses had unsatisfactory knowledge of COVID-19. These findings were in a disagreement with the findings by Nemati, et al. [13] entitled "Assessment of Iranian nurses' knowledge and anxiety toward COVID-19 during the current outbreak in Iran" who found more than half of the nurses had satisfactory knowledge about COVID-19.

## **Conclusion**

The present study concluded that nurses who caring of children with COVID-19 faced challenges as high work pressure, lack of PPE, physical challenges, psychological challenges, problem related to use of PPE, lack of hospital support and societal burden. Nurses used adaptation strategies as physical adaptation, psychological and emotional adaptation, social adaptation, cognitive and educational adaptation and spiritual adaptation. There was highly statistically significant between total challenges of COVID-19 and total adaptation strategies among pediatric nurses in charge of caring for children with COVID-19.

## **Recommendations**

- Continuous instructional guidelines program for nurses caring for children with COVID-19 to increase their knowledge regarding children caring to improve their quality of life.
- Provision the guidelines booklet to newly nursing staff caring for children with COVID-19 to provide them by needed information of the challenge and how to use adaptation strategies.
- A hotline must be available to solve immediate problems of caregivers of children with COVID-19.

## **Ethical Considerations**

An official permission to conduct the proposed study was obtained from the scientific research ethics committee. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent and they had the right to refuse to participate. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time and confidentiality of the information where it was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

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