

Effect of Educational Program on Pediatric Nurses' Performance regarding to COVID-19

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Abstract

Background: COVID-19 is the disease caused by a new corona virus called SARS-CoV-2. Nurses has critical role and responsibility during COVID-19 pandemic. **Aim of the study:** This study aimed to assess effect of educational program on pediatric nurses' performance regarding to COVID-19. **Research Design;** A quasi experimental design was utilized in the study. **Settings;** This study was conducted at the isolation department and Intensive Care Unit (ICUs) at Benha Specialized Pediatric Hospital. **Subject;** A convenient sample included all available nurses (60) who working in the previously mentioned settings. **Tools of data collection; Tool (I):** Structure interviewing questioner to assess nurses' characteristic and knowledge regarding COVID-19. **Tool (II):** Observational checklist to assess nurses' practice regarding COVID-19. **Tool (III):** Nurses attitude regarding COVID-19 to assess nurses' attitude regarding to COVID-19. **Results:** There were statistically significant differences between the level of knowledge, practices and attitudes of pediatric nurses, their qualifications and years of experience before and after implementing the program. Also, there was positive correlation between pediatric nurses' knowledge, practice and attitude scores pre and post implementation of the educational program **Conclusion:** The educational program was effective in improving the level of pediatric nurse's performance regarding to COVID-19. **Recommendation:** Emphasizing on the importance of developing periodical training programs regarding care of children with corona virus for nurses working in intensive care unit and isolation department to improve their performance.

Keyword: Children, COVID -19, Educational program, Nurse's performance.

Introduction

Corona viruses are important human and animal pathogens. At the end of 2019, a novel corona virus was identified as the cause of a cluster of pneumonia cases in Wuhan, a city in the Hubei Province of China. It rapidly spread, resulting in an epidemic throughout China, followed by an increasing number of cases in other countries throughout the world. In February 2020, the World Health Organization (WHO) designated the disease COVID-19, which stands for corona virus disease 2019. The virus that causes COVID-19 is designated severe acute respiratory syndrome corona virus 2(SARS-CoV-2), previously, it was

referred to as 2019-novel COVID-19 (ANA, 2020).

Signs and symptoms of corona virus disease 2019 (COVID-19) may appear 2 to 14 days after exposure. Shortness of breath or difficulty breathing muscle aches, chills, sore throat, runny nose, headache, fever, cough and chest pain. The disease can cause severe medical complications and lead to death in some children. Complications can include pneumonia and trouble breathing, organ failure in several organs and heart problems (Jackson et al., 2020).

The virus can spread from an infected child's mouth or nose in small liquid particles

when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols. It is important to practice respiratory etiquette, for example by coughing into a flexed elbow, and to stay home and self-isolate until recover if child feel unwell. The best way to prevent and slow down transmission is to be well informed about the disease and how the virus spreads (**Zhang et al., 2020**).

COVID-19 vaccines with World Health Organization (WHO) are safe for most children 18 years and older, including those with pre-existing conditions, including autoimmune disorders. These conditions include: hypertension, diabetes, asthma, pulmonary, liver and kidney disease, as well as chronic infections that are stable and controlled (**Zhang and Fan, 2020**).

Prevention actions for COVID-19 should included improving ventilation, staying at home when suspected or confirmed COVID-19 protect child and others from infection by staying at least 2 meter apart from others, wearing a properly fitted mask, and washing hands or using an alcohol-based rub frequently. Avoiding touching eyes, nose and mouth. Practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue. Also, wearing a medical mask and performing and seeking medical advice, hand hygiene after disposing of the mask. Get vaccinated is very useful to prevent complication of infection (**MacLaren et al., 2020**).

Nurses have critical roles and responsibilities during the COVID-19 pandemic. They will continue to be at the front line of childcare in hospitals and actively involved with evaluation and monitoring in the community (**Adams and Walls, 2020**). Nurses are considering the

front line of the COVID-19 outbreak response and are exposed to hazards that put them at risk of infection. So it is vital that they are supported to protect themselves with specific infection, prevention procedures and sufficient provision of protective gear at their practice settings, including; masks, robes, eye cover, face shields, and gloves. Nursing managers and instructors must include guidance to nurses and support personnel on emerging COVID-19 problems and hazards that are unique to their field of work (**Barnett and Grabowski, 2020**).

Signification of the study

Corona virus disease 2019 (COVID-19) has been spreading globally, with severe impacts on health children and economies. Nursing is an essential component of medical care, and nurses' knowledge, attitude, and practice (KAP) about the prevention and control of diseases which directly affects children's health outcomes (**Veerdonk and Van, 2020**).

COVID-19 as a clinical emergency requires high level of pediatric nurses' performance toward children infected with corona virus to prevent complications of disease which may lead to death. The preparation of pediatric nurses with knowledge, practice and facilities can affect positively on their attitude. So, pediatric nurses play an important role in health care system as they provide high quality nursing care. Also, pediatric nurse's performance regarding COVID-19 is very crucial (**Song, 2020**).

On the other hands, in Egypt an average 25.218 children are positive cases with COVID-19 and 974 children reported cases of death (**Egypt Care, 2022**). For this concern, the current study was conducted to improve pediatric nurses' performance regarding COVID-19.

Aim of the study

This study aimed to assess effect of educational program on pediatric nurses' performance regarding to COVID-19.

Hypothesis

Total scores of pediatric nurses' performance regarding COVID-19 will be improved after implementation of the educational program.

Subjects and Methods

Research design:

A quasi- experimental research design was utilized to conduct this study.

Settings:

The current study was carried out in isolation departments and Intensive Care Unit (ICUs) in Benha specialized Pediatric Hospital and Benha University Hospital at Benha city.

Subjects:

A convenient sample of nurses total number 60 nurses were included in the current study where,(20 pediatric nurses working in Benha Specialized Pediatric Hospital and 40 pediatric nurses working in Benha University Hospital) and working in isolation departments and intensive care unit and giving care for children with COVID-19 at a period of six months.

Tools of data collection:

Data were collected through using the following tools:

Tool (I):- A Structured Interviewing Questionnaire Sheet:-

This tool was designed in Arabic by the researcher after reviewing the related literatures and under supervision of supervisors. It was consisted of two parts:

Part (1):- Personal characteristics of the studied nurses

This part assessed personal characteristics of the studied nurses and included: age, gender, qualification, years of experience,

and their attendance of any training program about COVID-19.

Part (2):-Nurses' knowledge regarding to COVID-19which included the following:

a- Nurses' knowledge regarding to general information about corona virus including (8) questions : definition, type of virus, country of virus, source of virus, factors affecting spread of virus, factor that contribute to the spread of the virus, contact with pets result in infection with the virus.

b- Nurses' knowledge regarding to signs and symptoms of virus corona, including (7) questions: signs and symptoms of virus corona in children, difference between disease stages, symptoms of the first wave symptoms, symptoms of the second wave, symptoms of the third wave, symptoms of the fourth waves, symptoms of the fifth wave.

c- Nurses' knowledge regarding to methods of infection including (6) questions: methods of infection, temperature of weather, infection gets from a child who does not appear symptoms of the disease, uses of mobile from an infected child to a healthy child transmit the virus, period of stay on surfaces, Liquid used to disinfect different surfaces.

d-Nurses' knowledge regarding to diagnostic methods including (7) questions: diagnostic methods of disease, uses of scanners, expected temperature scale, abnormal results in blood analysis, difference between corona virus and seasonal flu, the children most susceptible to infection with corona virus, the incubation period of corona virus.

e- Nurses' knowledge regarding to treatment of corona virus including (11) questions: treatment of signs and symptoms of disease stages (first ,second, third, fourth and fifth) , there is effect of antibiotic on disease, effect of antibiotics in treating corona virus, medicines that prevent infection

with corona virus, corona virus has affect blood clotting factors in children, the effect corona virus on blood clotting factors in children, all children infected with corona virus treated with anticoagulants.

f- Nurses' knowledge regarding to the vaccine of corona virus including (17) questions: availability of vaccine, common vaccine in Egypt, type of vaccine, duration between vaccine dose side effect for (Sinopharma, AstraZeneca, Pfizer, Johnson & Johnson, Moderna and Sinovac), a recovered child can get infected again with virus, time period for child to infected the virus again, child recovering from virus infection is source of infection.

g- Nurses' knowledge regarding to isolation including (15) questions: definition, there are difference between isolation at home and isolation in the hospital, the difference between isolation at home and isolation in the hospital, medicines are taken during home isolation for children infected with corona virus, advices for children in isolation, precautions for children in isolation, duration for isolation, nurse scan infected with corona virus during working in an isolation hospital, preparation of isolation hospital, precautions for nurses in isolation, causes of corona infection in isolation hospital, type of room is it preferable to isolate the child in when he is infected with corona virus, child is advisable to wear a face mask in isolation, times does an infected child wear a mask, the proper way to give a child oxygen in isolation.

i- Nurses' knowledge regarding to methods of prevention of corona virus including (8) questions : methods of prevention of corona virus, Nutrition have a role in preventing the emerging corona virus proper nutrition, precautions for prevention to children , tips to follow to protect children from the corona virus, child infected with corona virus will

carry the virus for life, a healthy child has been in contact with a child infected with corona virus, appearance of symptoms of corona virus in child.

j- Nurses' knowledge regarding to protective clothing of corona virus including (4) questions: masks prefer, times for wearing masks, sterilization of masks, Gloves be worn in public places to protect against corona virus.

k- Nurses' knowledge regarding to complications of corona virus in children including (5) questions: There are complications of corona virus in child; complications of corona virus appear on children, complications of corona virus in children on respiratory and circulatory systems and skin.

Scoring system for nurses' knowledge: -

The studied nurse's answers were compared with the model key answer, where (2) scores were given for correct and complete answer, (1) scores was given for correct and incomplete answer while (0) score was given for incorrect / didn't know answer.

- The total score for all (88) questions was (176) which represent 100 % according to nurses' responses, their total level of the knowledge was categorized as the following:-
- **Good level** (75% to 100%) correct answer (132-176) questions.
- **Average level** (60% to less than 75%) correct answer (105-131) questions.
- **Poor level** (less than 60%) correct answer (less than 130) questions

Tool(II):- An observational checklist :-It was adapted from Chughtai, (2020) to assess the nurses' practice related to virus corona and consists of (46) steps under the following six general steps including the following ; uses of preventive measures, uses of personal protective equipment, uses of personal

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hygiene , uses strict environmental disinfection, cultural behavior help in spread corona virus and care of children with COVID -19. **Uses of preventive measures** ; it was consisted of (10) steps. **Uses of personal protective equipment**; it consisted of (9) steps. **Uses of personal hygiene**; it consisted of (7) steps. **Uses strict environmental disinfection**; it consisted of (7) steps. **Cultural behavior that helps in spread corona virus**; it consisted of (4) steps. **Care of children with COVID -19**; it consisted of (9) steps.

Scoring system for the practice: -

The correctly step done scored (1) grade and (0) score when the step not done .The total score for all (46) items was 46 marks which represent 100%.The total level of nurse's practice was categorized as the following:-

- **Competent** (100%) of total practice scores
- **Incompetent** (<100%) of total practice scores

Tool (III):-Nurses' attitudes regarding COVID-19. This part assessed nurse's attitudes regarding to COVID19. It was adapted from **Googan, (2020)** and consists of (26)questions such as the following :-Do you think that corona virus will be completely eradicated in the world, do you feel that Egypt will defeat the corona virus, do you think you could get the virus, Feeling worried about children from contracting the corona virus, Thinking contract the corona virus, that will be isolated in the hospital, Thinking that washing hands with frequent soap and water prevents infection with the corona virus, Thinking that active participation in hospital infection control programs reduces the spread of the virus, Think corona vaccine is available and must get it, Think that children with corona should be placed in isolation, Thinking that the medical team is ready to participate in the process of preventing

epidemic diseases in the community, Thinking that preventive measures can prevent the spread of the disease, Feeling that the Corona virus is a very dangerous disease for children, Thinking that anyone who has been in contact with a child infected with the virus should be isolated at home, Feeling that the virus is like any normal disease in children and there is no need to worry , Feeling afraid of contracting the virus when giving nursing care to a child infected with the virus, Thinking that cases of virus infection in children are constantly increasing, Thinking that the precautions taken by the Egyptian government are sufficient to eliminate the virus , Thinking that the corona virus in children is diagnosed in an accurate way , Thinking that there are children who have been completely cured of the virus, Thinking that the protocol used in hospitals to treat children infected with the virus is sufficient and effective, Thinking that social isolation has a negative impact on the mental health of children, Thinking receiving a flu vaccination for children helps treat corona virus, Thinking that washing a child's nose with saline helps eliminate the virus, Thinking pediatric nurses have enough information about the virus, Thinking that all children infected with the virus should be admitted to intensive care unit, Thinking there are post-corona symptoms (post-corona syndrome) for children.

The scoring system for nurses' attitude was as the following: -

The total scores of nurses' attitude was categorized as the following:

The agree scored (3) grade and neutral scored (2) and disagree scored (1). However, the total scores for all (26) items were (78) marks which represent 100%, the total level of nurse's attitude were categorized as the following: -

- **Positive attitude** ($60\% \leq 100\%$) score (47-78)

- **Negative attitude** (<60%) score (less than 47)

Content validity:

The validity of the study tools was done through a jury of three expert (three professors) in the Pediatric Nursing field from faculty of Nursing at Benha University. The experts reviewed the tools for its clarity, relevance, comprehensiveness, simplicity and applicability; accordingly, minor modifications were done.

Reliability:

Reliability of the study tools was tested for its internal consistency by administrating the tools to the same study subjects under similar conditions using Cronbach's Alpha coefficient test. Results from repeated testing was compared (test-retest reliability). Where it was found that $r=0.98$ for the structured interview questionnaire format and $r=0.99$ for observational checklists. These results indicate a high degree of reliability for the current study tools.

Ethical considerations

The study was approved by Ethical Research Committee at Faculty of Nursing /Benha University. The researcher explained the aim, natural and expected outcomes of the study to the studied nurses and ensured that their participation in the study was voluntary and they have the right to withdraw from the study at any time without any obligations. All collected data would be used for research purpose only. Written consent was obtained from all nurses before participation in this study. Confidentiality of gathered data and results were secured.

Pilot study

A pilot study was carried out on 10% of the total study sample (6 nurses) to test content applicability, clarity, feasibility, practicality of the study tools, and to estimate time needed to fill each tool. No radical modifications were done according to the

results of pilot study. Participants involved in the pilot study were included in the study sample. Pilot study was done through one month as it was carried out the beginning of September, 2021 until end of September, 2021.

Field work:

Field work was carried out through: assessment, planning, implementation and evaluation phases. Data were collected over period of 6 months starting from the beginning of October, 2021 to the end of March, 2022. The data were collected from the previously mentioned setting according to policy of the study setting. The researcher was available at each study settings by rotation during morning and afternoon shift. The researcher attended Benha Specialized Pediatric Hospital at Benha city 1day /week (Saturday) from 8A.M to 2P.M and Benha University Hospital at Benha city 2 days/week (Saturday) from 2A.M to 8P.M and (Monday) from 8A.M to 2P.M for 6 months .

The data were collected throughout two phases of assessment for nurses. The first phase was done prior to conduction of the educational program to determine the base line of data and identify their actual educational needs. While the second phase of assessment was done immediately, post conducting the educational program to evaluate its effect on nurse's knowledge, practice and attitude regarding to COVID - 19.

Assessment phase:

Data collected in this phase before implementing the educational program. The questionnaire sheets were distributed to all nurses individually to assess their performance (knowledge, and attitude), while practice was evaluated by the researchers' observation for the nurses' practice and determine nurse's needs regarding to

COVID-19 using the previous study tools. The time needed for filling all data collection tools were 45-65minutes, the average time needed to answer personal data and knowledge questions 15-20 minutes, and time needed to practice steps are 20-30minutes, and time needed to attitude steps were10-15minutes The period of assessment phase (pre-test) took one month (from the beginning of October 2021 to the end of October 2021).An average of 5-6 nurses were interviewed per /day. (2) Nurses per1day /weekly at Benha Specialized Pediatric Hospital and per (4) nurses 2day /weekly at Benha University Hospital at Benha city. Simple rewards such as (pens) were given for each nurse to encourage them to participate in the study.

Planning phase:

Based on baseline data obtained from pre-test assessment and relevant review of literature, the educational program was developed by the researcher in simple Arabic language. Different teaching methods (modified lecture, brain storming, demonstration, re- demonstration and group discussion) and suitable teaching media (power point, real equipment as well as booklet to be guide for nurses) were used.

Implementation phase:

The implementation phase was achieved through sessions, each session started by a summary of the previous session and the objectives of the new one, motivation and reinforcement were used during session to encourage nurses' participation in the study. The nurses were informed about the time and the place of sessions which were carried out at the pediatric units lecture room. The studied nurses were divided into 10 groups each group contained 6 nurses. The total number of session were 10 session 5 session for theoretical part each session consumed 50-75minutes , 3 sessions for practical part

where each session required from 40-55 minutes and 2 sessions for attitude where each session consumed 15-30minutes, 2days/week in the morning and afternoon shifts and was implemented according to nurses' physical and mental readiness. The program took 10 hours for each group. Each session included 10minutes for discussion and feedback. These sessions were repeated to each group of nurses. This phase took four months from the beginning of November 2021 to the end of February 2022.

Evaluation phase

Immediately after implementation of educational program contents, the post-test was done to assess nurses' knowledge, practice and attitude regarding to COVID -19 using the same tools of pre-test related to pediatric nurses' performance regarding to COVID-19.This took about one month (from the beginning of March, 2022to the end of March, 2022).

Statistical analysis

The collected data was arranged, categorized, coded, analyzed and tabulated using electronic computer and Statistical Package for Social Sciences (SPSS) software version 20. The collected data were represented in terms of number, percentage distribution mean, standard deviation and relation coefficient Chi- square test and correlation. Paired t-test was used to test the significance of some variances. A significant level value was considered when $p < 0.05$ and $p \leq 0.01$.

Results:

Table (1): This table showed that 46.7% of the studied nurses were in the age group 25< 35 years with mean age 33.38 ± 4.6 years. Concerning qualifications, 70 % of them have technical institute of nursing. Regarding years of experience of the studied nurses 50% of they have 5- 10 years .Regarding to work of place, 68.3% of the studied nurses

worked in isolation department and all of studied nurses 100% didn't attend any training program about COVID -19, more than three quarters, 80. % of the studied nurses' was from rural area. While one fifth, 20.0% of them were from urban area.

Figure (1): This figure reflected that 31.7% of them had good level of knowledge pre implementation of the educational program. Compared to 85.% of them had good level of knowledge post implementation of the educational program.

Figure (2): This figure proved that 70.% of the studied nurses had incompetent practice

regarding pre implementation educational program. Meanwhile, 88.3% of them had competent practice post educational program implementation.

Figure (3): This figure showed that 61.7% of the studied nurses had negative attitude regarding to COVID-19. While 85. %of them had a positive attitude regarding COVID-19.

Table (2): showed that, there was positive correlation between total knowledge, practices and attitude scores of the studied nurses at pre/post educational program implementation (p value <0.000).

Table (1): Distribution of studied nurses according to their personal characteristics (n=60)

Nurses' characteristics	No.	%
Age/ years		
>25	10	16.7
25<35	28	46.7
35≤45	22	36.7
Min –Max	24-39	
Mean ±SD	33.38±4.67	
Gender		
Male	7	11.7
Female	53	88.3
Qualification		
Technical school of Nursing	10	16.7
Technical institute of Nursing	42	70.0
Bachelor of nursing	8	13.3
Years of experience in work place		
<5 years	8	16.7
5-10 years	30	46.7
>10 years	22	36.7
Workplace		
ICU	19	31.7
Isolation departments	41	68.3
Attendance training program about COVID-19		
No	60	100.0
Residence		
Urban	48	80.0
Rural	12	20.0

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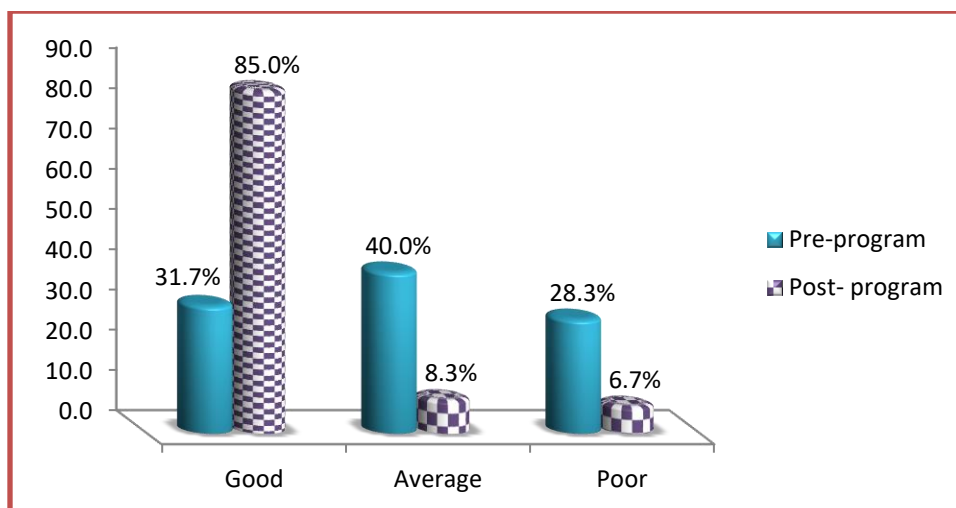


Figure (1): Distribution of the studied nurses according to their total knowledge level pre / post implementation of the educational program (n=60)

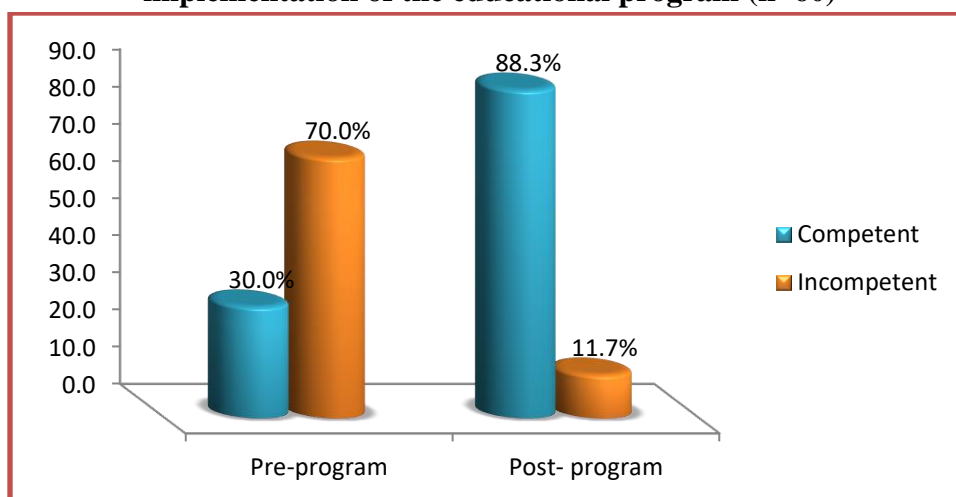


Figure (2): Distribution of studied nurses according to their total practice level pre/post implementation of the educational program (n=60)

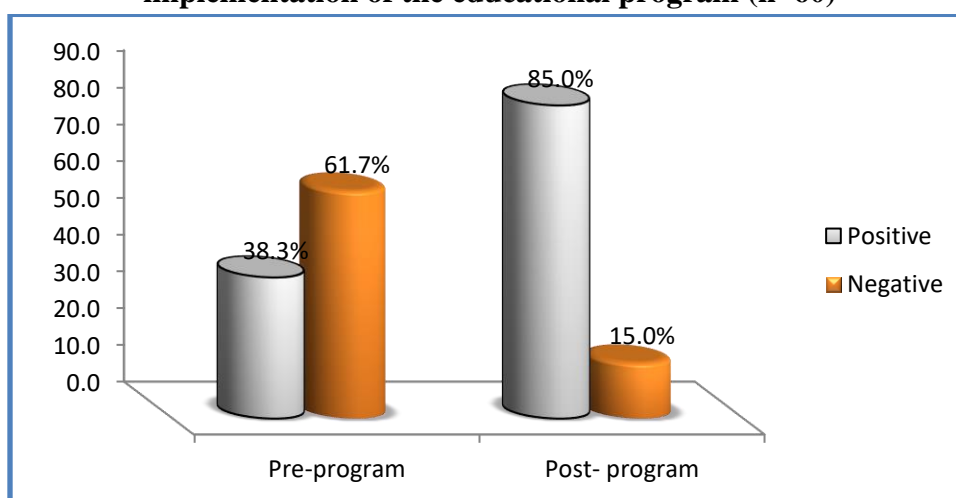


Figure (3): Distribution of the studied nurse's total attitude level according to COVID- 19 pre /post implementation of the educational Program (n=60)

Table (2): Correlation matrix between nurses 'total knowledge, practices and attitude regarding COVID -19

Variables		Pre educational program			Post educational program		
		Knowledge	Practices	Attitude	Knowledge	Practices	Attitude
Knowledge	R	1	.925	.741	1	.880	.956
	p-value		.000**	.000**		.000**	.000**
No.	N	60	60	60	60	60	60
Practices	r	.925	1	.869	.880	1	.746
	p-value	.000**		.000**	.000**		.000**
No.	N	60	60	60	60	60	60
Attitude	r	.741	.869	1	.956	.746	1
	p-value	.000**	.000**		.000**	.000**	
No.	N	60	60	60	60	60	60

Discussion

Corona viruses (COVID19) are a group of highly diverse, enveloped, positive-sense, and single-stranded RNA viruses. They cause several diseases involving respiratory, enteric, hepatic, and neurological systems with vary severity among children. The main symptoms of COVID-19 included; fever, fatigue, dyspnea, and myalgia, Children may initially present with diarrhea and nausea headache, shortness of breath, dry cough and malaise (**Byrne et al., 2020**).

Regarding personal characteristics of the studied nurses the current study findings that, the mean age of the studied nurses was 33.38±4.6 years. This could be due to the demanding nature of emergency disease (corona virus) so that the older nurses may be more experience in field work than younger nurses. These finding was disagreed with **Faizul, (2022)** in a study entitled" Nursing care recommendation for pediatric COVID-19 patients in the hospital setting "who found that the mean of age of the studied sample was 25.84±4.02years

Concerning to qualification of the studied nurses it was found that less than three quarters of them were graduated from nursing technical institute regarding to their years of experience it was found that half of the studied nurses were 5-10 years. This results was disagree with results of the study done by **Sarath, (2021)** entitled "Nurses’ perspectives of taking care of children with corona virus disease 2019 " it found that more than three quarters (79.6%) of the studied nurses were nursing technical institute and less than eight years of experience.

In relation to attendance the studied nurses of training program related to COVID -19 the finding of current study showed that all studied nurses not attending training program related to COVID -19. According to researcher point of view this could be due to absence of planned training program in the place work which offered from Ministry of Health and lack of professional team This finding similar to results of the study done by **Al Thobaity, (2020)** entitled "Nurses on the

Frontline against the COVID-19 Pandemic" it found that 97% of studied nurses was not attending training program related to COVID-19

Regarding personal characteristics of the studied nurses showed that the majority of the studied nurses were female while less than one fifth of them were male. According to researcher opinion this could be due to male nurses prefer working in private hospitals or travelling outside the country. These finding disagreed with study done by **Mustafa, (2021)** entitled "Nurses' experience towards caring for children with proven COVID-19 infection at pediatric intensive care unit " who found that three quarters 75% of the studied nurses were female while quarter 25% of them were male.

Concerning to personal characteristics of the studied nurses it was cleared that more than three quarters of the studied nurses were from rural area while one fifth of them were from urban area. This may be due to that the fact that people in the village prefer and interested study in the field of nursing than people in city. These finding agreed with study done by **Kochi, (2020)** entitled " Nurses' performance regarding cardiac and arrhythmic complications in children with COVID-19" who found that more than three quarters 82% of the studied nurses were from rural area while less than one fifth 18.0% of them were from urban area.

Regarding to pediatric nurses' total knowledge about COVID-19 according to **figure (1)** showed it was that less than one third of them had poor level of total knowledge pre implementation of the educational program. In contrast the majority of them had good level of total knowledge post implementation of the educational program. From the researcher point of view this improvement may be due to implementation of the educational program.

However, this finding was in the same context with Huang and **Wang, (2020)** in the study entitled "Quality of nursing care toward children infected with 2019 novel corona virus in Wuhan, China" who documented that less than one third 27.9% of them had poor level of total knowledge about COVID-19 pre educational program implementation. In contrast the majority 88% of them had good level of total knowledge post implementation of the educational program.

Regarding to pediatric nurses' total practice level according to **figure (2)** it was showed that less than three quarters of the studied nurses had incompetent practice regarding to COVID-19 pre implementation of the educational program. On the other hand the majority of them had competent practice regarding to COVID-19 post implementation of the educational program. This might be due to the improvement in nurses' knowledge after implementation of the educational program which affect positively on their practice. Also, nurses working in the isolation departments and intensive care unit are trained and equipped with standard or enhanced (personal protective equipment) PPE at all times. This finding was similar to result of **pan and sun, (2020)** entitled " Experience of nurses who caring with children with SARS-CoV-2 infections " who was found that less than three quarters 73% of the studied nurses had incompetent practice pre implementation of the educational program and the majority 86.9% of them had competent practice post implementation of the educational program.

Regarding to pediatric nurses' total score of attitude regarding COVID-19 according to **figure (3)** it was showed that less than two thirds of them had negative attitude about COVID-19 pre implementation of the educational program. In contrast the majority of them had positive attitude about

COVID-19 post implementation of the educational program. This improvement may be due to appropriate infection control and precaution measures in addition to social media update for this disease. However, this finding was agreed with results of study done by **Khalid, (2021)** entitled "Awareness, attitudes, prevention, and perceptions of COVID-19 outbreak among pediatric nurses in Saudi Arabia" who documented those less than two thirds 62.3% of them had negative attitude about COVID-19 pre implementation of the educational program. In contrast the majority 88% of them had positive attitude about COVID-19 post implementation of the educational program.

Regarding to correlation between total nurse's knowledge ,practice ,attitude regarding COVID -19 and their personal characteristic there was highly statistical significant positive correlation between total nurse's knowledge, practices, attitude regarding COVID-19 and their personal characteristics ($p < 0.000$) in the pre and post educational program implementation .This might be due to additionally work experience effects on knowledge, practices, attitude towards COVID-19 which the knowledge is the base line for the practice. This study was convenient with **Khalid, (2021)** it was found that there were strong positive correlation between total nurses knowledge, practices, attitude and their personal characteristic score ($p < 0.000$).

Conclusion

The educational program provided for nurses about COVID -19 was effective in improving the knowledge, practices and attitudes of pediatric nurses regarding to COVID-19, there were statistically significant differences between the level of knowledge, practices and attitudes of pediatric nurses, their qualifications and years of experience before and after

implementing the program, and there was positive correlation between total knowledge, practices and attitudes of pediatric nurses regarding to COVID-19

Recommendations:

- 1-Adapting the program related to the care of children infected with COVID-19 for nurses working in the intensive care units and isolation departments to improve performance of the nurses to maintain the children safety.
- 2- Creating a knowledge program for new nurses to introduce COVID-19 and how to prevent it.
- 3- Coordinating among members of health team to improve the quality of care provided to children infected with COVID-19
- 4-Designing educational programs via social media for mothers and fathers about caring for children infected with COVID-19
- 5- Providing psychological support to pediatric nurses and training on coping skills with psychological stress when dealing with infected children and their mothers.

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تأثير برنامج تعليمي على أداء ممرضين الأطفال فيما يتعلق بفيروس كورونا المستجد

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هدفت الدراسة إلى تقييم تأثير برنامج تعليمي على أداء ممرضين الأطفال فيما يتعلق بفيروس كورونا المستجد. تم تصميم بحث شبه تجريبي (قبل الاختبار / بعد الاختبار) لإجراء هذه الدراسة. وقد أجريت الدراسة في أقسام العزل ووحدة العناية المركزة في مستشفى الأطفال التخصصي ومستشفى بنها الجامعي. نوع العينة: عينة هادفة. حجم العينة: (60) ممرضة وممرض من العاملين في الأماكن المذكورة سابقا. وظهرت النتائج انه كان هناك ارتباط ايجابي بين معرفة ممرضين الأطفال وممارساتهم ودرجات اتجاهاتهم قبل وبعد تنفيذ البرنامج التعليمي كما توجد فروق ذات دلالة إحصائية بين مستوى معرفة وممارسات واتجاهات ممرضات الأطفال ومؤهلاتهم وسنوات خبرتهم قبل وبعد تنفيذ البرنامج. الخلاصة: خلصت الدراسة إلى أن البرنامج التعليمي كان له تأثير فعال في تحسين أداء ممرضين الأطفال تجاه فيروس كورونا المستجد. كما اوصت الدراسة بضرورة التأكيد على أهميه تطوير برامج تدريبية دورية خاصة برعاية الأطفال المصابين بفيروس كورونا لممرضين الأطفال الذين يعملون في أقسام العزل ووحدة العناية المركزة لتحسين أدائهم ، مع ضرورة إجراء مزيد من الدراسات على عينة أكبر من الممرضات في مناطق أخرى لضمان تعميم النتائج ، وتنفيذ برنامج تدريب دوري للممرضات في أقسام العزل ووحدة العناية المركزة فيما يتعلق بفيروس كورونا المستجد وتوزيع ملصقات وكتيبات باللغة العربية للممرضات في وحدة العناية المركزة وأقسام العزل.