

Effect of Interventional Training Program on Performance and Perception of Nursing staff toward COVID-19 Virus

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Abstract:

Background: Nursing staff are considered as the first line of defense against the COVID-19 pandemic. Inadequate performance and incorrect perception among them leading to deterioration of nursing care provided in health care agency. **Aim:** to evaluate the effect of interventional training program on performance and perception of nursing staff toward COVID-19 virus. **Research design:** A quasi - experimental (pre / post assessment) was used. **Setting:** The study was conducted in four hospital places (Departments, Clinics, Intensive Care Units, and Operating rooms) at Assiut University Hospitals. **Sample:** Consists of 300 nurses working in the Main Assiut hospital building. **Study tool:** Structured interview questionnaire; that consists of five parts; demographic characteristics, pre / post nursing staff assessment for (knowledge& preventive practice level, attitudes and perception towards COVID-19 **Results:** The majority of participant in this study showed satisfactory level of knowledge and satisfactory practice level after conducting of the training program about COVID-19 with statistical significance difference in the program phases with P value < 0.01. As well they had a positive attitude and perception toward caring –of patients with COVID-19 post program. A positive correlation co- efficient between the level of nurses' knowledge score and their attitudes and perception about Covid19. **Conclusion:** The application of the interventional training program led to an improvement in the nursing staff performance and perception toward caring of patients with Covid -19. **Recommendation:** Continued in-service training programs on Covid- 19 mutants and regular equipped the nursing staff with the necessary educational facilities and materials necessary to upgrade their level of knowledge and skills.

Keywords: COVID-19 Virus, Interventional Training Program, Performance & Perception

Introduction:

The world is facing the COVID-19 as a recently found coronavirus that has become a pandemic, affecting thousands of individuals all over the world (WHO, 2020). Corona viruses are a large family of viruses that cause illness ranging from the common cold to more Severe Acute Respiratory Syndrome (SARS-CoV) Ren et al., (2020). In addition, and the infectious nature of this virus has led to an increase in the number of cases and daily mortalities. At the time of writing this research; the pandemic has led to more than (86) million and (920) thousand cases and one million, furthermore (878) thousand deaths worldwide. In Egypt (58963) cases have been registered with (8747) mortalities recorded till 20 of January 2021 (WHO, 2021).

The virus COVID-19 incubation period is (2–14) days with the majority of patients (80%) have mild symptoms. Clinical manifestations of COVID-19 range from asymptomatic to acute respiratory distress syndrome and multiple organ failure. The common

manifestations include; nasal congestion and runny nose, muscle pain, sore throat, fever, dry cough, difficulty in breath, chest pain, fatigue, headache ,tasting changes, abdominal pain, diarrhea, and olfactory dysfunction. About (20%) of patients with COVID-19 had serious manifestations; as sepsis, septic shock and body systems failure which causes deaths in about (2%) of cases Islam (2021) & Saniasiaya & Islam (2021).

COVID-19 could be spread through human-to-human transmission and indirect contact with contaminated objects. Additionally, contaminated droplets can settle on objects such as plastic, stainless steel, copper, and cardboard, the patient could become infected if they touch contaminated surface with COVID-19 objects and then make contact with skin mucous membranes such as the eyes, nose, or mouth. Old age patient and pre-existence of chronic illnesses have been identified as more potential risk factors for the disease severity and mortality Guan, et al., (2020).

Nursing performance focused primarily on nurse's knowledge and skills in healthcare settings. It plays a vital role in care of patients with COVID-19. Furthermore it is important measure of professionalism and patient safety. Exclusively the qualified nursing staff is responsible for assessing and monitoring conditions of patients with COVID-19, coordinating their care, administering medications precisely, and communicating with the patients and their families. Also nurse's knowledge is a prerequisite for establishing prevention beliefs, forming positive attitudes, and promoting positive behaviors. Also nurse's attitude towards disease affect the effectiveness of their coping strategies and behaviors to a certain extent followed by correct practice regarding COVID-19 **Sagherian, et al., (2018)**.

The nurse's knowledge and awareness of mode of disease transmission, basic hygiene principles and measures in public health crisis are vitally important for developing effective control measures for COVID-19 as an emergent infectious pathogen causing an acute respiratory disease. Furthermore, the nurse's perception describe how nurses take the information on caring of patient with COVID-19 and who respond to it according to the guidance of WHO protocol **McEachan et al., (2018)**.

There is no doubt that perception and behavioral change measures from health authorities towards COVID-19 pandemic depend on the society's culture and their knowledge, attitude and practice toward this disease. The professional nurses are on the frontline battling against this pandemic so the training program intervention on nurse's performance and perception among nursing staff regarding to COVID-19 virus is vitally importance to achieve an ultimate success against the ongoing encounter against COVID-19.

Significant of the study :

Form the researchers experience as trainers in the Center of Technical Training and Nursing Development at Assuit University Hospitals they observed that is a gap in aspects of knowledge, attitudes and practice among nursing staff during COVID-19 pandemic. As epidemics reports; verify that COVID-19 infection rate among nursing staff with this virus was more increased **World Health Organization (2020)** Additionally; the vulnerabilities of their job for being infected, transmission of the infection to family members, and social stigma about the concerns In addition to inadequate knowledge and incorrect attitude among nursing staff directly effects on practices and lead to spread of disease **Munir et al., (2020)**.

Operational definitions:

The training program intervention: It is a classrooms or training are aimed to delivering

learner-centric experiences. Training is used as an intervention strategy and requires acquisition of knowledge skills and attitude. Training interventions involve needs assessment, content design, and development (includes the presentation of content as well as learning activities), program implementation, and evaluation **Mashhood (2020)**.

Nurses Performance's: a set of nursing activities or behaviors that are performed by nurses and directed toward the recovery and well-being of Covid -19 patients assigned to their care. Knowledge, preventive practices, traits, motives and attitudes all contribute to effective nursing performance **Sachan et al., (2018)**.

Nurse's attitude: It was operationally defined as a staff nurse's proclivity to respond positively or negatively to delivering care to COVID-19 patients, as expressed through feelings or opinions. **Huynh, et al., (2020)**.

Perception: It was defined as how nurses accept COVID-19 information and respond to it; for the purposes of this study perception denotes how something is viewed, comprehended, or interpreted by a nurse. **Rabaan, et al., (2017) & Wong, et al., (2020)**.

Aims of the study were to:

General objectives; Evaluate the effect of interventional training program on performance and perception of nursing staff toward COVID-19 virus through:

Specific objectives;

1. Assessing the baseline of performance and perception of the nursing staff toward COVID-19 virus.
2. Design and implementing interventional training program on performance and perception of the nursing staff toward COVID-19 virus based on the baseline assessment.
3. Evaluate the effect of interventional training program on performance and perception of the nursing staff toward COVID-19 virus.

Research hypothesis:

1. The post mean knowledge scores of the nursing staff who will be exposed to the training program will be higher than their pre mean knowledge scores.
2. The post mean preventive practice scores of nursing staff who will be exposed to the intervention program will be higher than their pre mean practice scores
3. The level of attitude & perception among nursing staff will be more positive after implementation of the training program .
4. A positive relationship will exist between knowledge score and level of attitude & perception after the training program implementation.

Subjects and Method :

Study design: A quasi - experimental (pre / post) design was utilized in this study.

Setting: The study was conducted at the main Assiut University Hospital (Egypt) .

Sample: convenience sample from the nursing staff who work in the main Assiut University Hospitals at different four hospital sitting (300 nurses male and female) (Departments, Outpatient clinics, Operations and Intensive care units) all nurses were included except those with chronic illness

Study tool:

In order to collect the necessary data for this study the following tool were used:

Tool (1): Structured interview questionnaire:

Developed by the researchers based on the **Centre for Disease Control (CDC 2020)**, (**WHO 2020**) and relevant literature review **Reuben & Gyar (2016) & Etokidem et al., (2018)** to assess staff nurses knowledge , attitude practice, and perception regarding COVID-19 among the nursing staff ;this questionnaire consisted of 5 main domains which include the following:

The first domain questions: related to the demographic data of the nursing staff, it consisted of (7 questions) about the gender, age, marital status, educational qualifications, total years of experiences in the current hospital, area of practice and in service training program related to Covid -19.

The 2nd domain; Nursing staff knowledge assessment (Pre/posttest): amid to assess the knowledge level of the nursing staff as regarding to Covid-19 is comprised of 10 questions (8 multiple choice and 2Yes or No questions in the form of definition of Covid-19 virus, etiology, patient with Covid-19 positive signs & symptoms, virus incubation period, method of virus spread, patients risk group, investigation and diagnosis measures, transmission of infection, methods precautions/preventions and complications.

Scoring system for knowledge domain:

For the knowledge items; Total score ranges from (0-20 degree).A correct answer response was scored (2 degree), incomplete correct scored (1 degree) and incorrect answer scored 0. The scores were converted into a percent score. — Nurse's total level of knowledge has been classified as the following; if the score below (50%), it was set as unsatisfactory level of knowledge and from (50-70%) have average knowledge level finally (more than 70 %) scored as satisfactory knowledge level **Onianwa et al., (2017)**.

The 3rd domain: Preventive practice level assessment among nursing staff regarding to Covid – 19: (pre-post observation checklist): This part was constructed after reviewing the related literature and recommendations according to **WHO** and (**CDC**), it

was used to assess nursing staff preventive skills during providing care for Covid- 19 patients. It was designed and include (90) steps that are most commonly used, in association with essential related nursing activities as follows: Proper used of personal protective equipment (PPE) during pandemic and during working in isolation place as (wearing and removal of different types of face mask, face shield, gloves, gowning, hand washing by its different methods, personal hygiene measures **World Health Organization (2020)**.

Scoring system for preventive practical domain:

Response of each item was recorded on 3-point Likert scale as follows don correctly (2-degree), done incorrectly (1-degree), not done (0- degree). Total score ranges from 0 to 90, with an overall lower mean score > 75 % indicates unsatisfactory nurses practice level, above mean score 75 % indicates satisfactory nurses practice level **Taha (2017)**.

The 4rd domain; the questionnaire assess the attitude level among the nursing staff towards COVID19. And asses' attitude of the nursing staff toward the protective measure against Covid-19. It included (20) items 8 multiple choice and 12 Yes or No questions as who should wear a face mask, follow self-isolation measures, ideal distance between people, follow the recommendations of ministry of health, agree to avoid crowded place, feeling regarding the current Covid-19,...etc.

Total attitude score ranges from 0-20 the positive response was scored 1 and negative response scored 0. The scores were converted into a percent score. Nurse's total level of attitude has been classified as follows; if the score below 60% was set for negative attitude and above 60% for positive attitude response scored **Reem et al., (2020)**.

The 5th domain; Questionnaire assessing the perception level among the nursing staff towards COVID-19: this part aimed to assess the perception of nursing staff towards the national and community response of COVID-19 pandemic, and the availability of COVID-19 care protocols at their hospital. It included 10 items (6 multiple choice and 4Yes or No questions) as government response to stop the global pandemic in Egypt, vaccine acceptance, obligatory lockdown and measure taking in Egypt compliance and satisfaction with WHO guidelines, media coverage.....etc. Total score ranges from 0-10; to determine the perception domain score, a mean was calculated with two levels: "low perception" when the nurse's staff answers had a mean value of 0- 6 (> 60%). And a high degree of perception" for answers with a mean score of 6: 10 (60 %) **Reem et al., (2020)**.

The participants were directed to complete the knowledge, attitude, perception questionnaire before program, and post the first one immediately post program intervention, then after two months. But the observation checklist for preventive practices measure done by the researchers before training at the center of continues education and immediately post demonstrations of the procedure finally post program application after 2 months by indirect observation for the nursing staff practices in different study sitting.

Validity and Reliability:

Face validity

A bilingual group of seven experts was selected to test the content and face validity of the tool domain. The questionnaires were reviewed for face validity by five of experts in Medical Surgical Nursing and two in Community Health Medicine, minimal modifications were done to reach the final valid version of the tools.

Reliability:

The internal consistencies of the questionnaires were calculated using Cornbrash's alpha coefficients. The Cornbrash's alpha of the questionnaire was ($= 0.077$) which indicated good reliability, "indicating that data collected through these questionnaires were reliable" to assess knowledge, attitude, practice and perception among nursing staff.

A pilot study:

A pilot study was carried out in February (2020) and conducted on 10% of the sample (30 nurses) to evaluate the applicability and clarity of the study tools and estimating the time needed to data collection for each tool. Based on the results of the pilot study, no modifications were made. Nurses selected for the pilot study included in the main study. This pilot study was conducted two months before collection of data.

Method and fieldwork description:

The program conducted in four phases (preparatory phase, planning phase, implementation phase and evaluation phase).

Phase I: The preparatory phase (Assessment phase):

It includes reviewing of current national and international related literature and theoretical knowledge related to Covid -19 using text books, articles, magazines and internet was done to develop the study tools for data collection. Official approval & administration permission was obtained from the manager of the main Assiut University hospital to collect the necessary data.

The researchers designed and tested the study tool and the training program after extensive literature review, WHO and CDC guidelines then the final form of the proposed program was checked by a panel of experts to test content validity and reliability.

Phase II: Planning phase

Based on finding of the assessment phase, the interventional training program was developed by the researchers, after extensive literature review considering nurses' needs.

Phase III: The implementation phase

The study carried out a cross-sectional survey among nurses during the COVID-19 outbreak. The study assessed 300 nurses for knowledge, practice, attitude, and perception. After gaining consent from the hospital administration, for this study to be carried out. Informed consent was implied from the nursing staff member who participates in the study, information confidentiality was guaranteed. Participants' participation is optional, and they have the ability to withdraw at any moment. (no one withdraw from the study)

Plan of implementing the program

- At initial interview the researchers introduced themselves to initiate line of communication, explained the nature & purpose of the study and filled out the tool parts.
- The data collection start from the beginning of April (2020) to the end of Augustus (2020) were covering 15 weeks, by organizing the total numbers of nurses (300) into subgroups (20) for each week.

Plan of implementing the training program:-

To facilitate the implementation of the training program; researchers prepared booklet, teaching aids and media (pictures, handouts). This was followed by arranging for the program sessions schedule based on the contents, number of nurses as the following consequence.

Formulation of objectives: the purpose of the program was to improve the performance & perception of nursing staff members in the care of patient with COVID-19 virus

Contents of the program:

- The program sessions schedule has been divided in to a theoretical and practical part.
- The program was implemented for each subgroup (20 nurses) weekly for 4 days from Sunday to Wednesday.
- The total number hours per day in the program was (3) hours from 9Am- 12 Am divided into one theoretical hour and two practical hours taken into consideration the social distancing and precautionary measures.

Planning of action:

On the first training day for each subgroup; Session 1: Greeting the nurses, each participant fills the questionnaire pretest, in the first hours from (9-10AM) then they received information about the nature of the virus, methods of transmission and how to prevent it,.....etc. Then the practical part from (10-12 AM) for demonstration of personal protective

equipment (PPE) wearing and removal, types of face mask and correct using ,face shield, and distance place, personal hygiene measures.

On the second training day for each subgroup;

Session 2: In the first hours from (9- 10 AM) each participant received information regarding positive attitude towards the pandemic. Then the practical part from (10- 12 AM) for demonstration of different types of hand washing.

On the third training day for each subgroup;

Session 3: In the first hours from (9- 10AM) each participant received information regarding positive perception toward pandemic followed by the practical part from (10- 12 AM) for application of preventive practical skills related to the following procedure (ware and removal of gown, gloves by demonstration procedure stapes).

On the fourth training day for each subgroup;

Session 4: fill post-test, furthermore reinforce the feedback and then thanks the studied nursing staff for their active participation.

- Training sessions of the program were conducted in the Center of Technical Training and Nursing Development at Assuite University hospital. Program of intervention was designed, with general objectives.
- The training program content included: - Program objective and the content was selected carefully and included topics about all knowledge related to the pandemic, definition, history, types, mode of transmission, signs and symptoms, personal protective equipment (PPE) during pandemic and during working in isolation place in addition the role of immunity system in fainting this infection and how to improv this system through eating a healthy diet and exercises.
- At the end of the program implemented, Arabic language booklet about the program was given to each nurse as teaching media and reference.

Methods of teaching: Selection of teaching methods was governed by consideration for subject characteristics and program contents. The methods used in teaching the program were lecture, group discussion, demonstration and re demonstration.

Teaching aids:

The teaching aids used in the program were booklet handouts, power point and videos.

Learning outcomes of the interventional training program:

this program shed light on the increase in the level of knowledge & skills of the nursing staff regarding dealing with the Corona pandemic and helped them to approach positive behavior towards precautionary measures in their daily activities and with their families and various members of the community as

well as the people in contact with positive Covid- 19 or the healthy personnel.

Phase IV: The evaluation phase:

During this phase; an evaluation of the effect of the training program on nurses performance and perceptions regarding COVID-19 virus done through reassessing and comparing level of nurses' knowledge and preventive practice pre and post program implementation and follow-up after 2 month)

Ethical considerations:

Research proposal approved from the Ethical Committee in the Faculty of Nursing. There was no risk for study subjects during application of the research. The study was followed common ethical principles in clinical research. Oral consent was obtained from patients or guidance that was participated in the study, after explaining the nature and purpose of the study. Confidentiality and anonymity were assured. Study subject had the right to refuse to participate or withdraw from the study without any rational at any time. Study subject privacy was considered during collection of data

Statistical analysis:

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (Mean, SD). Chi-square test and fisher exact test used to compare between categorical variables where compare between continuous variables by t-test and ANOVA Test. We are used person Correlation to Appear the Association between scores; a two-tailed $p < 0.05$ was considered statistically significant. All analyses were performed with the IBM SPSS 20.0 software.

Result:**Table (1): Frequency distribution of the studied sample according to their demographic characteristics N. (300)**

Variables	Frequency	
	N.	%
Gender		
Male	76	25.3%
Female	224	74.7%
Age		
20-<30	174	58.0%
30-< 40	87	29.0%
40-< 50	33	11.0%
50 - 60	6	2.0%
Mean :SD = 1.57± 0.766		
Marital status		
Married	112	37.4%
Single	183	61.0 %
Divorced	1	0.3 %
Widow	4	1.3 %
Educational qualifications		
Nursing bachloria degree	71	23.7 %
High diploma of Nursing (institute graduations)	154	51.3 %
Nursing diploma (secondary nursing school)	75	25.0 %
Total years of experience in the current hospital		
less 1 year	85	28.3 %
1-10 years	51	17.0 %
More than 10 years	164	54.7 %
Area of practice		
Clinics	66	22.0 %
Intensive care	50	16.7 %
Department	112	37.3 %
Operations	72	24.0 %
In- service training program related to Cavid - 19		
No	245	81.7 %
Yes	55	18.3 %

Table (2): Comparison of the level of knowledge among the nursing staff regarding Covid-19 during the three program phases (pre, immediately post and follow up after 2 months)

Knowledge Level	Max Score	Pre		Post		Follow up		P. value	P1	P2	P3
		N.	%	N.	%	N.	%				
Poor	<50%	293	97.7	0	0.0	0	0.0				
Faire	50-70%	7	2.3	14	4.7	41	13.7	<0.001**	<0.001**	<0.001**	<0.001**
Good	>70%	0	0.0	286	95.3	259	86.3				
Mean±SD	20	6.28±1.91		17.08±1.4		16.5±1.76		<0.001**	<0.001**	<0.001**	<0.001**

Chi square test for qualitative data between the two groups or more

One-way Anova T-test quantitative data between the three groups

**Significant level at P value < 0

P. value:- Comparison between three time(pre, post and flow up)

P1:- Comparison between pre& post P2:- Comparison between pre& flow P3:- Comparison between post & flow up

Table (3): Comparison between preventive practical levels among nursing staff regarding Covid-19 during the three program phases (pre, immediately post and follow up after 2 months)

Nurses practices	N.	Mean ±SD	F	P. value	P1	P2	P3
Pre program	300	18.53±4.24	49.489	<0.001**	<0.001**	<0.001**	0.090
Immediately Post	300	21.01±2.6					
Follow up (after 2 months)	300	20.56±2.63					

One-way Anova with LCD method

P1:- Comparison between Pre immediately Post

P3:- Comparison between immediately Post& Follow up

P. value:- Comparison between All

P2:- Comparison between Pre & Follow up

**Significant level at P value < 0

Table (4): Comparison between attitude level among nursing staff regarding Covid -19 during the three program phases (pre, immediately post and follow up after 2 months) N. = (300)

Attitude Level	Max Score	Pre		Post		Follow up after 2 months		P. value	P1	P2	P3
		N.	%	N.	%	N.	%				
Negative	<60%	300	100.0	3	1.0	5	1.7	<0.001**	<0.001**	<0.001**	0.725
Positive	>60%	0	0.0	297	99.0	295	98.3				
Mean±SD	20	5.92±2.34		18.04±1.67		19.01±1.4		<0.001**	<0.001**	<0.001**	<0.001**

Chi square test for qualitative data between the two groups Or More

One-way Anova T-test quantitative data between the Three groups or more

**Significant level at P value < 0.01

P. value:- Comparison between Three Time (Pre, Post and Flow up)

P1:- Comparison between Pre & Post

P2:- Comparison between Pre& Flow up

P3:- Comparison between Post & Flow up

Table (5): Comparison between perception level among nursing staff regarding Covid-19 during the three program phases (pre, immediately post and follow up after 2 months) N. = (300)

Nurses perception About ovid19	Pre		Post		Follow up after 2 onths		P. value	P1	P2	P3
	N.	%	N.	%	N.	%				
Low perception	276	92.0	17	5.7	7	2.3	<0.001**	<0.001**	<0.001**	0.037*
High perception	24	8.0	283	94.3	293	97.7				
Mean±SD	13.27±3.17		21.39±2.45		22.29±2.4		<0.001**	<0.001**	<0.001**	<0.001**

One-way A-nova with LCD method

P. value: - Comparison between all

P1:- Comparison between pre& immediately post

P2:- Comparison between pre & follow up

P3:- Comparison between immediately post& follow up

**Significant level at P value < 0

Table (6): Comparison between pre, post program (immediately and after 2 month) for the study sample as regard staff nurses' knowledge, attitude and perceptions scores about Covid-19

Variables	Pre	Post immediately	Follow up after 2 month	P. value	P1	P2	P3
	Mean± SD	Mean± SD	Mean± SD				
Knowledge score	6.28±1.91	17.08±1.4	16.5±1.76	<0.001**	<0.001**	<0.001**	<0.001**
Attitude	5.92±2.34	19.01±1.4	18.04±1.67	<0.001**	<0.001**	<0.001**	<0.001**
Perceptions	13.27±3.17	21.39±2.45	22.29±2.4	<0.001**	<0.001**	<0.001**	<0.001**

One-way Anova with LCD method

P. value: - Comparison between all

P1:- Comparison between pre & immediately post

P2:- Comparison between pre & follow up

P3:- Comparison between immediately post& follow up

**Significant level at P value < 0

Table (7): Correlation Co- efficient between nurse's knowledge score, nurse's attitude and perception about Covid19 during three program phases (pre, immediately post and follow up after 2 month)

Correlations	Knowledge score					
	Pre		Post immediately		Follow up after 2 month	
	R	P	R	P	r	P
Attitude score	0.018	0.751	0.180	0.002*	0.162	0.005*
Perception score	-0.032	0.581	0.430	0.001*	0.120	0.038*

* Statistically Significant correlation at P. value <0.5

** Statistically Significant correlation at P. value <0.01

Table (1): Reveals that the highest percentage of the study sample their ages ranged between 20 - >30 years old (58.0%) with Mean ± SD (1.57± 0.766) and the vast majority are females, single nurses by present of (74.7% and 61.0%) respectively. As regarding to educational qualifications; (51.3 %) of the studied staff nurses are graduates from a technical institute.

Also (54.7%) of the nursing staff have more than10 years of experience. Furthermore the majority of them (81.7%) did not attend any in serves training programs related to Covid - 19

Table (2): Summarizes the mean knowledge score level which was low (6.28±1.91) in pre training program than increased immediately post training

(17.08±1.4), somewhat decrease in follow up after 2 month (16.5±1.76). Also shows that; a statistical significant difference between nurses staff mean knowledge score in relation to all items in different training intervention program phases (P1) Comparison between pre& post , (P2) comparison between pre & flow up and (P3) Comparison between post & flow up) with P value < 0.01.

Table (3): Summarizes the mean preventive practices level for the study sample is somewhat low (18.53±4.24) in pre training program increases immediately post training (21.01±2.6), but slightly decrease in follow up after 2 months (20.56±2.63). Also shows that; statistical significant difference between nurses staff mean practice score in relation to all items in (P1,P2) of the program phase; (P1) Comparison between pre & post and (P2) comparison between pre & flow up and with P value < 0.01.

Table (4): Describes that there is a negative attitude level (5.92±2.34) among nursing staff in preprogram improved positively post training, and follow up after 2 months (18.04±1.67, 19.01±1.4) respectively. Also shows a statistical significant difference between nurses staff mean attitude score in relation to all items of training intervention (P1, P2) of the program phase; (P1) Comparison between pre & post and (P2) comparison between pre & flow up and with P value < 0.01.

Table (5): Clears the mean perception score level for participant who was low (13.27±3.17) in pre training program increased immediately post and after 2 months from training program (21.39±2.45, 22.29±2.4) respectively. Also shows a statistically significant deference between participants' responses as regarding perception in relation to all items in different program phases (pre 1, p2 and p3) with P-value < 0.01.

Table (6): shows that there is a highly statistical significant difference between pre, post program (immediately and after 2 month) for the study sample as regard staff nurses' knowledge, attitude and perceptions scores about Covid19 P- value < 0.01.

Table (7): Reveals that there is a positive correlation co- efficient between the level of nurses' knowledge score and their attitudes and perception about Covid19 during two program phases (immediately post and follow up after 2 months)

Discussion:

Based on the results of the present study, more than half of the nursing staff had high diploma of nursing (institute) qualifications with no in-service training program related to caring of Covid -19 patients. This is consistent with the study conducted by **Dewart et al., (2020)** who verify that the most study sample had

no in-service training courses related to Covid- 19 and argued that the Covid-19 pandemic is bringing many issues to the foreground in nursing education curriculums. And it has been stated that it has already transformed the educational landscape, as it is a pivotal and significant moment in the education of future health care workers. This is a watershed moment in the education of healthcare professionals; now is the time to seriously consider recommendations for clinical hours and their consequences for nursing care providers achieving their essential abilities. And this situation presents an opportunity for deliberate nursing staffing adjustment. Also, this is in the same line with **Kathy et al., (2021)** who mentioned that COVID-19 has created an urgent need for direct nursing care in addition to the need to organized training programs to counter the spread of the problem. All health care providers are entering a highly stressed health system that is facing unprecedented challenges. Without appropriate nursing preparation, educational training programs, and support, these novice practitioners are liable to place patients and other health care professionals at further risk. So high quality nursing education and in-service training programs are therefore an essential during the Covid-19 health crisis.

In the category of nursing staff knowledge levels; the present study verify that after implementation of the training program; nurses' knowledge score levels regarding Covid-19 were significantly improved in immediately post and two month after training program. The result is consistent with the studies done by **Huynh et al., (2020) & Nemati et al., (2020)** who stated that most nurses' staff having satisfactory knowledge level as regarding COVID -19 in all program implementation phase. And in the same line for the study done by **Nepal et al., (2020) & Saqlain et al.,(2020)** who revealed that nurses knowledge score improved post program accounted on nurses' staff interest to learn new issues related to Covid pandemic. Also, agree with **Xu et al., (2020)** who mentioned that it is important to empower the nursing staff member by supporting their ability to acquire the necessary knowledge with implementation of appropriate education to improv nursing staff members' willingness to work for patients with Covid -19

From the researchers opinions this high percentage of knowledge among nurses regarding COVID -19 was due to the immense volume of information that was provided by the social media from WHO guidelines. Furthermore all nurses were having good readiness for learning new topics and more capacity of learning to overcome thesis pandemic crises. As well as the training program booklet, teaching aids about the theoretical infoCOVID-19 pandemic distributed

to nurses used as an ongoing reference, which was helpful in nurses' acquisition of new knowledge.

Also the present study showed a statistical significant difference between nurses staff mean knowledge score in relation to all items in different training intervention program phases. This agree with **McEachan et al., (2016) & Saqlain et al., (2020)** who denoted a statistically difference in the overall knowledge scores of participants between the pre and post training program regarding COVID-19 pandemic.

Interestingly; in this study the majority of the study sample participants had a satisfactory level of preventive practice post training program during car of patient with COVID-19. This consistent with the study conducted by **Zhou et al., (2020)** who clarified that professional nurse have satisfactory practice regarding COVID-19 post training program. Furthermore this agree with **Sachan et al., (2018)** who decided that practical training program for staff nurse improve the level of performance , this plays a vital role in the prevention of spread of virus infection .

Also at the same lines with **Anuradha and Dandeker, (2020) Wu & McGowan, (2020)** who stressed on the important of empower the nursing staff by supporting their capability to acquire the important skills. With application of appropriate education and protective measures to improving nursing staff members' performance level to care for patient with Covid -19. As well agree with **Modi, et al., (2020)** who indicated that after completing the COVID-19 training session, nurse's staff reported increased preventive measures.

The current study figured out that there was a highly statistical significant difference between nurses' practice in pre and post program application (immediately and after 2 months) as regarding different types of hand washing ,PPE wearing and removal during caring patients with Covid-19 in isolation ward, hand washing by its different types , types of face mask and correct using ,face shield, this was in line with the study done by **Shanafelt, et al., (2020)** who stated that statistical difference between staff nurse preventive practice in pre and post educational training.

From the researcher's opinion; to combat the Corona virus outbreak, the nurses should be able to practice in their full clinical competence and employ preventive measures procedures. The fact that educational programs, particularly the WHO guidelines focused on preventative procedures during care of patient with COVID-19, may have revealed better preventive actions in our findings.. In addition; the application of the training program throughout the

practical sessions with encouragement of questions, participation and interactions along the program.

As regarding to the nursing staff attitude toward COVID-19 virus; the current study figured out that the majority of the study sample participants had a negative attitude level toward COVID-19 in preprogram implementation, this in the same line with study done by **Smith, et al., (2017), Adams and walls (2020)** who explained that during an infection outbreak of the virus nursing staff member and healthcare professionals experience some negative attitude and emotions, like fear, anxiety, and helplessness,

The study demonstrates that attitude of nursing staff regarding Covid-19 were significantly improved positively in immediately post and two month after training program. This agrees with the studies conducted by **Nemati et al., (2020)** who mentioned that attitude of nurses during the COVID 19 pandemic had appositve level post program application. In addition to the study done by **Sun, et al., (2020)** who stated that during the Covid virus pandemic, recognizing the roots of bad emotions and attitude, anxiety level, burnout, and stress could help to improve attitudes. Also agree with another studies done in China by **Liu et al., (2020)** who founded a positive attitudes related to Covid 19 transmission, symptoms and preventive measures for COVID 19 infection post the study .

From the researcher point of view, it is critical to understand the attitudes of nursing staff as well as their individual sources of anxiety and terror. Because anxiety from infection could erode confidence in providing patient care, it plays an important role in infection prevention and management. During an epidemic, nurse's experience increased exposure risk, massive workloads, ethical issues, and a rapidly changing practice environment that differs significantly from what they are used to, all of which have an impact on their attitudes concerning COVID 19 infection.

The present study clarified that the perception level for participant is low in pre training program increased immediately post and after 2 months from the implementation of the training program in addition to a statistically significant deference between the study sample as regarding perception in relation to all items in different program phases This agree with the studies conducted by **Taghrir, et al., (2020)** who mentioned that high perception level of nurses during the COVID -19 pandemic showed post program implementation. Improving nurses' perception considers a professional benefits and important strategy that leading to improve their willingness to participate in patients care with COVID- 19. And agree with **Aldohyan et al., (2019)**

who emphasized that changing nurses' perceptions of infectious disorders like Covid -19 could lead to better infection control and prevention. As a result, delivering educational training programs on COVID-19 may help to improve perception. Nurses' ability to prepare, adapt, and successfully respond to any disease epidemic may also be strengthened by the training program that they learned treating these diseases

The current study verified that a positive correlation between the level of nurses' knowledge score and their attitudes and perception about Covid19 during two program phases (immediately post and follow up after 2 months). This agree with **Alsahafi, & Cheng, (2016)** **Asif, et al., (2019)** When dealing with the Covid virus outbreak, there was a substantial association between knowledge level and perception in all healthcare personnel. This also could be explained by the respondents' view that they possessed greater awareness about prevention .Additionally; adequate knowledge and awareness promote attitudes, perception, and preventive behavior, and create a strong nursing practice. Finally; in this study it could be concluded that implementation of interventional training program for nursing staff has achieved its objectives and hypothesis by improving knowledge level, preventive practice, attitude and perception toward Covid -19.

Conclusion:

Up on the results of the current study it could be concluded that:

- The application of the interventional training program leading to an improvement in the nursing staff performance and perception toward Covid -19.
- Improving nurses' knowledge and practice lead to favorable effect on the level of attitude & perception toward Covid -19 among nurses after implementation of the training program.

Recommendations:

- Continued nursing education and in-service training programs about Covid- 19 mutants and regular equipped the nursing staff with the necessary educational facilities and materials necessary to upgrade the knowledge and skills.
- Raising health awareness about Covid -19 vaccinations, new treatment modalities in management of corona mutants and other updates of COVID-19 across all healthcare professions.
- Nurse managers should provide appropriate and supporting structure to promote staff awareness in all health care facilities.
- Encourage the nursing staff to engage in activities that include attending various conferences in the hospital about management of new corona mutants.

- Collaborate with continuing education department in all healthcare organization to develop effective training program on concepts and guidelines in management of new corona mutants

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