Training Program for Nurses to Enhance Competence Level Regarding COVID 19 Prevention

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Abstract

COVID 19 is an emerging respiratory disease caused by a novel coronavirus. Globally spread of Covid-19 had a momentous consequence on people of all nations, races, and socio-economic groups. Competency is the state of possessing qualities and abilities that are required for a particular role or task. Training programs equip nurses with specialized knowledge and competency to better manage infectious diseases in a competent level in order to support the response to the epidemic. **Aim:** the study aimed to evaluate the effect of training program for nurses to enhance competence level regarding COVID 19 prevention. **Setting:** the study conducted at outpatient clinic (antenatal, gynecological and family planning units) at Ain Shams Maternity University Hospital. **Sample**: A convenient sample included one hundred forty nurses. **Method**: A quasi experimental design was used. **Tools:** two tools were used. **First tool**: Self-administered questionnaire, **second tool**: Observational checklist sheet was used to assess nurses' performance regarding Protective Measures and Compliance with Standard Precautions. **The result of the study** shows that Pre-program knowledge scores for nurses were lower (32.9%), but they improved to (90.0%) in the post-program with a statistically significant improvement. In addition, pre-program incompetent practise was higher (84.3%) than post-program incompetent practice, with highly statistically significant differences (P - value.0001). **Conclusion**: Applying a COVID-19 training programme to nurses was successfully effective in improving their knowledge and practices for covid19 prevention. **Accordingly, the following recommendation is proposed:** Apply training programs for whole nursing staff to enhance their competency level regarding covid19 prevention.

Key Words: Training program, Competency, COVID-19 prevention.

Introduction

COVID-19, caused by severe acute respiratory syndrome, was considered a global pandemic epidemic, deemed by the World Health Organisation as a public health emergency of international concern. Efforts made by all nations in concert to stop the COVID-19 virus's fast spread **(Zhou, et al, 2020).**

The virus spreads in most cases when an infected individual coughs, sneezes, or talks, where the virus is mostly disseminated by saliva droplets or nasal secretions. Drops cannot extend more than six feet (almost two metres). It may float in the air for up to three hours while still being intact and contagious in droplets **(Zhu et al., 2020).**

Additionally, tainted droplets may settle down on materials including plastic, stainless steel, copper, and cardboard. When a person touches surfaces that have the COVID 19 virus on them and then touches mucous membranes like the eyes, nose, or mouth, they risk contracting the disease **(WHO 2020).**

Infections frequently manifest as respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties. In more serious instances, the infection may result in mortality, severe acute respiratory syndrome, renal failure, pneumonia, and other complications **(Zegarra et al., 2020).**

Nurses play an important role in promoting health and overcoming delays in receiving appropriate healthcare services related to the COVID 19 situation by improving awareness, education, diagnosis, treatment, disease management and research into preventive measures towards coronavirus by providing much-needed support and information **(Srichan et al., 2020).**

The goal of the training program is to increase the level of nurses' management and support of women who are infected with the Corona virus by ensuring that these services are linked to primary care and encouraging greater awareness of this illness among all nurses who come into contact with women **(Srichan et al., 2020).**

Nurses assist in providing care along the continuum of care, including promotion, prevention, treatment, and rehabilitation. They also share health information, carry out infection prevention and control measures, work in intensive care units, and make sure routine services are still provided **(Choi et al., 2020).**

Therefore, the main aim of the training program is to take action to enhance the level of nurses to empower them, through immediate efforts by incorporating new educational knowledge into practice for the control and prevention of COVID-19 and the care of infected people through compliance with preventative measures and as part of respiratory hygiene, one should always wash their hands before eating and after using the restroom. They should also avoid close contact with others **(WHO, 2020)**.

Significance of the study

It's conceivable that certain healthcare professionals' lack of knowledge of infection prevention procedures contributes to the disease's spread among healthcare personnel **(Zhong et al., 2020).**

In addition, nurses are in direct contact with contaminated patients and suspects. They may be on the front lines of the COVID-19 epidemic and are at risk of contamination due to their exposure to the threats. Worldwide Council of Nurses reported that 2.195% of all verified COVID-19 cases—260 nurses who had died—were among the more than 90 000 health-care workers worldwide who were infected with the virus. In addition, the World Health Organisation (WHO) said that 194 member nations are not giving detailed information on health worker infections as they attempt to deal with the unprecedented epidemic **(Nguyen, Zhang, & Pandolfi, 2020).**

Nursing competencies are typically defined as a dynamic combination of knowledge (basic for specialised), skills (assessment, critical thinking, communication, time management, technical skills, teaching, and customer services), and abilities (caring, character, and professional presentation) that contribute to appreciative practise **(Kohrt et al., 2018).**

The effects of COVID-19 in Egypt may be predicted by analysing the knowledge, attitudes, and potential perception of infection risk among health care personnel **(Abdel Wahed, et al., 2020).**

Aim of the Study

The study aimed to evaluate the effect of training program for nurses to enhance competence level regarding COVID 19 prevention through:

1. Assessing nurses' knowledge regarding COVID 19 prevention pre implementation of training program.

2. Assessing nurses' competency level regarding COVID 19 prevention pre implementation of training program.

3. Implement training program for improving nurses' knowledge and competency level regarding COVID 19 prevention.

4. Evaluating the effect of training program on nurses' knowledge and competency level.

Research hypothesis

The training program for nurses will be enhance competence level regarding COVID 19 prevention.

Operational definitions:

Competency level: means its ability to successfully perform a job while applying the required skills and characteristics. Competency involves knowing how to react to situations and using previously learned to complete tasks.

Training program: is defined as a set of activities that includes attending one or more courses in order to improve one's performance, productivity, skills, and knowledge.

Subjects and methods

Research *design:* a quasi-experimental approach was employed to carry out the study's objective.

Setting*:* This study was carried out at outpatient clinic (antenatal, gynecological and family planning units) at Ain Shams Maternity University Hospital.

Subject: All nurses working in outpatient units at Ain Shams Maternity University Hospital. A convenient sample consisting of (140) nurses were recruited in the study.

Tools for data collection

Two tools of data collection were used.

First tool: Self-administered questionnaire **consisted of two parts:**

Part I: This was constructed by researchers after reviewing the related literature. It assessed the necessary data which covered the aim of the study. The questionnaire was used to assess general characteristics of nurses such as (age, education level, and years of experience marital status, and place of current residence).

Part II: Nurses' knowledge regarding COVID 19.

This part designed to assess nurses' knowledge regarding COVID 19 virus. It was adapted from **Zhong et al., (2020).** This part was intended to test the nurses.

There were 12 questions total, including 4 about clinical manifestations (Q1-Q4), 3 about transmission pathways (Q5-Q7), and 5 on Covid-19 prevention and control (Q8-Q12). Two replies were given in response to these questions. Responses to the questions varied from a right response received one point, whereas an incorrect or unknown response received zero points.

Knowledge scoring system:

The total knowledge score was 12, with a higher number indicating a good knowledge of COVID-19. The accurate response received one mark, whereas the unknowing or erroneous response received zero. The total scores were graded as <75 % unsatisfactory, ≥ 75 satisfactory. Overall test-retest reliability coefficients were Cronbach's alpha values of 0.88.

Second tool: Observational checklist adapted from (Daniele et al., 2019) to assess nurses' level of competency regarding (Protective Measures against COVID-19) and Compliance with Standard Precautions Scale (CSPS) Tool. It covered 19 statements.

Scoring system:

Each item was scored on a 3 points Likert scale (1= not competent, 2= somewhat competent, 3= extremely competent). Total score ranged from 20-60. Nurses consider somewhat competent if nurses total score was ≥ 86, and nurses consider extremely competent if nurses' total score was ≥ 87. Cronbach's alpha coefficient was 0.90.

Validity and Reliability: Content and face validity were performed by 3 professors of family and community health nursing specialty and two professors from the Maternal and Neonatal health nursing department, at Faculty of Nursing. Using the Cronbach alpha and Pearson correlation, the reliability test was established, and the results revealed strong internal consistency (construct validity Cronbach alpha = 0.88).

Pilot Study: A pilot study was conducted on 10% of the total study sample (14) nurses to test and evaluate the clarity, and applicability of the study tools and to estimate the time required for completion of each study tool. The pilot study sample was included in the main study sample.

Operational Design

Administrative and Ethical Considerations:

Before conducting the study, the Scientific Research Ethical Committee of Ain Shams

University's Faculty of Nursing gave its clearance. The director of the university hospital for mothers-to-be in Ain Shams then gave formal authorization. In order to get the nurses' consent to participate in the study, the researchers introduced themselves to them and explained what the study's objectives were. Researchers made sure that the study did not present any risks or hazards to their subjects. Additionally, they chose to take part in the study voluntarily. All activities that took place during data collection were treated as confidential, and researchers approached nurses who were willing to take part in the study and asked for verbal agreement to affirm their assent.

Field work:

After official permissions to carry out the study, were obtained the aim of the study was explained to the subjects. The study was carried out over a period of 3 months started from beginning of May 2020 to the end of august 2020. The average time consumed to fill in the tools was 20 minutes for the self-administered questionnaire and 45 minutes for the observational checklists. The previously mentioned settings were visited by the researchers three days/week (Saturdays, Mondays & Wednesdays) from 9.00 a.m. to 2.00 p.m.

The questionnaire was distributed to the nurses twice, before and after the training program to evaluate the effect of the training program on nursing knowledge and competency level during their performance of nursing skills regarding prevention of COVID19.

Training Program Regarding COVID 19:

This program was conducted on four consecutive phases, assessment, developing training program, implementation, and evaluation the program.

Phase 1: Using the self-administered questionnaire to gather information from the aforementioned context, a pre-program assessment was carried out. This phase aimed to assess nurses' knowledge and practice regarding COVID 19.

Phase 2: Based on actual nurses' needs assessment (knowledge and practises), a training programme addressing COVID 19 virus was created. The following topics were covered in the theoretical content: definition, high risk group, symptoms and indicators, diagnostic techniques, complications, and nursing management of COVID 19.

Phase 3: Implementation of training program:

The training programme for COVID 19 was implemented in the aforementioned location. The program's goals and objectives were introduced at the start of the first session. Groups of nurses were formed, with each group containing around 8–10 nurses. Each session began with a recap of the information presented in prior sessions and an explanation of the goals of the current topic, both of which were done in plain language appropriate for nurses with varying levels of education. The seminar concluded with a recap of its points and any comments received from the audience.

The Training program concerning COVID 19 composed of five sessions to complete the training programme for, with each session lasting between 30 and 45 minutes depending on the demands of the nurses and the group's health.

The theoretical part of the training program was presented in two sessions in the form of lectures/discussions.

The practical part consisted of two sessions in the form of demonstration and re-demonstration. The researchers used effective media of conveying information as, power point presentations and posters.

Training program handout was developed and offered for nurses as a reference to be used after implementation of program.

Phase 4: Evaluation:

The evaluation phases were done after two weeks post implementation of the training program by comparing nurses' knowledge and practices regarding COVID 19 virus pre and post implementation of program.

Statistical design:

The collected data were organized; categorized, analyzed using the statistical package for social studies (SPSS) version (20). (Windows Microsoft). Data were presented using descriptive statistics in form of frequencies and percentages for qualitative variables, mean and standard deviations for quantitative variables. The statistical test such as chi-square test was to determine relation between qualitative data and the comparison between mean scores was performed using Fisher exact and ANOVA test. Statistical significance difference was considered when p-value ≤ 0.05, and high significance when p-value ≤ 0.001 and no statistical significance difference was considered when p-value > 0.05.

Results:

Table (1): shows that, 92.9% of studied sample aged from 22 < 27 years old with mean (25.2±4.8). Regarding level of education, 82.9% of them were diploma / technical institute degree. Concerning to duration of work, 91.4% of them were 1- 5 years,

concerning to attendance of training regarding Covid 19 at maternity care unit, 20.0% of them had previous training and concerning to residence, 62.9% of them were living in urban areas, while 37.1% of them live in rural areas.

Figure 1 shows that, among sample under study, 65.7% obtained their knowledge about Covid-19 through television or radio, 4.3% via beer, and 30% from employment.

Figure (2): shows that, 32.9% of studied sample had satisfactory knowledge pre-program while post- program improved to 90% with highly statistically significance differences P – value .001

Figure (3) illustrates, with highly statistically significant differences P – value 0.001, that the post-program competency level of practice for the examined sample increased from 15.7% to 81.4%.

Table (2): Shows that, (100.0% of studied sample who aged from (32 – 36), 70.0% who had B.Scs. degree, 71.4% of who had attendance of training regarding and 54.2% who live in urban areas) all had satisfactory knowledge pre-program with statistically significance differences P – value $\leq$ (0.027 &0.034, 0.02, 0.009, 0.001 and 0.006. while there were no statistically significance differences between studied sample age, educational level, duration of work, attendance of training about Covid19, and place of residence with their total knowledge in post post-program.

Table (3) Reveals that 96.2% of the study sample, who reside in urban areas, had competency levels
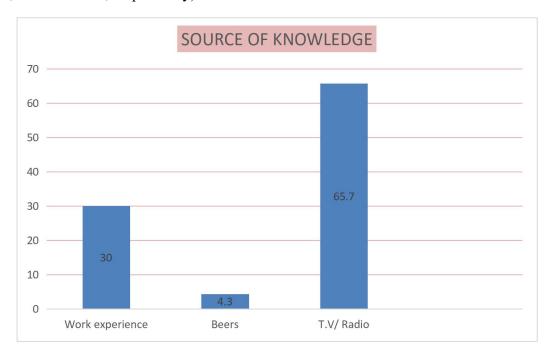
for practise in the pre- and post-program periods, with statistically significant differences P values of (0.036&0.015). However, there were no statistically significant changes in nurses' pre- and post-program practise in terms of their age, educational level, length of employment, and attendance at training.

Table (4) displays a slight positive association (r= 0.264, P value 0.0001) between the study sample's knowledge scores and their pre-program practice scores.

In addition, there was a positive association between the knowledge scores of the examined sample prior to the programme and their knowledge and practise scores afterwards (r= 0.382, P value 0.001; r= 0.337, P value 0.004; r= 0.363, P value 0.002, respectively).

Table (1): Frequency distribution of the studied sample regarding to their socio-demographic characteristics (n= 140)

Items	No.	%
Age		
22- < 27	130	92.9
27- < 32	4	2.9
32 – 36	6	4.2
Mean ±SD range	25.2±4.8	
Education level		
Diploma / technical institute	116	82.9
B.Sc	20	14.2
Masters	4	2.9
Duration of work		
1 -5	128	91.4
5 – 10	4	2.9
10 – 15	8	5.7
Attendance of training about Covid-19		
Yes	28	20.0
No	112	80.0
Place of residence		
Rural	52	37.1
Urban	88	62.9

Figure (1):   Percentage distribution of the studied sample regarding to their sources of knowledge regarding Covid-19 (n = 140)

p >0.05non-significant ** *p*<0.001 highly significant
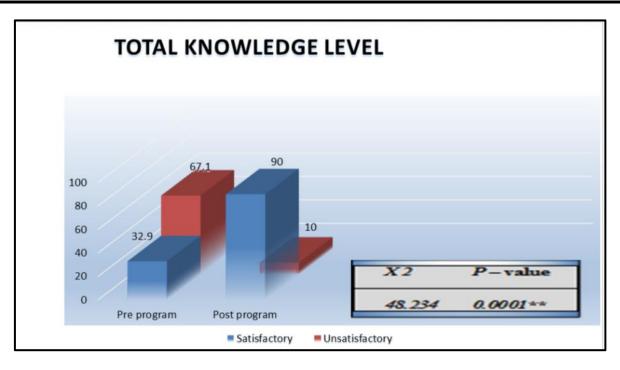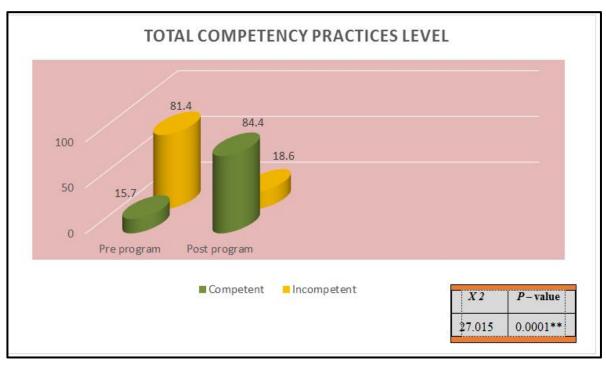
Figure (2): Percentage distribution of the studied sample regarding to their total knowledge levels regarding Covid-19 pre and post program (n =140).

p >0.05non-significant ** *p*<0.001 highly significant

Figure (3): Percentage distribution of the studied sample regarding to their total competency practice level regardingCovid-19 pre and post program (n = 140).

Table (2): Relation between socio-demographic characteristics of the studied sample with their total knowledge levels regarding Covid19 pre/ post- program (n = 140).

Items	Total knowledge level (pre)				Total knowledge level (post)			
	Satisfactory(n = 46)		Unsatisfactory(n = 94)		unsatisfactory(n = 14)		satisfactory(n = 126)	
	No.	%	No.	%	No.	%	No.	%
Age								
22- < 27	38	29.2	92	70.8	14	10.8	116	89.2
27- < 32	2	50.0	2	50.0	0	0.0	4	100.0
32 – 36	6	100.0	0	0.0	0	0.0	6	100.0
Fisher test/P – value	6.202 (0.034)*				0.509 (0.741)			
Education level								
Diploma/ technical institute	30	25.9	86	74.1	14	12.1	102	87.9
B.Sc	14	70.0	6	30.0	0	0.0	20	100.0
Masters	2	50.0	2	50.0	0	.0	4	100.0
Fisher test/P – value	7.589 (0.02)*				1.099 (0.447)			
Duration of work								
1 -5	38	29.7	90	70.3	14	10.9	114	89.1
5 – 10	0	0.0	4	100.0	0	0.0	4	100.0
10 – 15	8	100.0	0	0.0	0	0.0	8	100.0
Fisher test/ P – value	8.008 (0.009)**				0.465 (0.694)			
Attendance of training about Covid19								
Yes	20	71.4	8	28.6	14	12.5	98	87.5
No	26	23.2	86	76.8	0	0.0	28	100.0
Fisher test/ P – value	11.802 (0.001)**				1.944 (0.163)			
Place of residence								
Rural	20	21.7	72	78.3	6	12.5	42	87.5
Urban	26	54.2	22	45.8	8	8.7	84	91.3
Fisher test/ P – value	7.517 (0.006)**				0.254 (0.615)			

Table (3): Relation between socio-demographic characteristics of the studied sample with their total competency level regarding Covid19 pre/ post program (n = 140).

Items	Total practice level(pre)				Total practice level(post)			
	incompetent(n = 118)		competent(n = 22)		Competent(n = 114)		Incompetent(n = 26)	
	No.	%	No.	%	No.	%		
Age								
22- < 27	110	84.6	20	15.4	106	81.5	24	18.5
27- < 32	4	100.0	0	0.0	4	100.0	0	0.0
32 – 36	4	66.7	2	33.3	4	66.7	2	33.3
Fisher test/ P– value	1.437 (0.582)				1.121 (0.641)			
Educationlevel								
Diploma/ technical institute	100	86.2	16	13.8	94	81.0	22	19.0
B.Sc	14	70.0	6	30.0	16	80.0	4	20.0
Masters	4	100.0	0	0.0	4	100.0	0	0.0
Fisher test/ P– value	2.043 (0.354)				0.361 (0.788)			
Duration ofwork								
1 -5	108	84.4	20	15.6	104	81.3	24	18.8
5 – 10	4	100.0	0	0.0	4	100.0	0	0.0
10 – 15	6	75.0	2	25.0	6	75.0	2	25.0
Fisher test/ P -value	0.923 (0.728)				0.682 (0.753)			
Attendance of training about Covid19								
No	92	82.1	20	17.9	88	78.6	24	21.4
Yes	26	92.9	2	7.1	26	92.9	2	7.1
Fisher test/ P -value	0.971 (0.324)				1.511 (0.219)			
Place of residence								
Rural	50	96.2	2	3.8	50	96.2	2	3.8
	68	77.3	20	22.7	64	72.7	24	27.3
Fisher test/ P -value	4.399 (0.036)*				5.931 (0.015)*			

Table (4): Correlation between total knowledge and competency level among studied sample pre and post-program (n = 140).

			Pre-program		Post-program	
			Knowledge	Competency	Knowledge	Competency
Pre- program	Knowledge	r	1			
		P-value				
	Competency	r	0.264	1		
		P value	0.027*			
Post- program	Knowledge	r	0.382	0.218	1	
		P value	0.001**	0.070		
	Competency	r	0.363	0.121	0.092	0.051-
		P value	0.002**	0.317	0.447	0.678

*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level

Discussion

Since the outbreak of COVID-19 epidemic, nurses—a crucial component of the global healthcare system—have encountered difficult situations and problems. Right now, as far as other healthcare providers are concerned, they are on the front lines of the battle against the COVID-19 outbreak, and they are striving to help their patients in every sector **(Garcia et al., 2020)**.

Developing nursing competencies can help provide care with evidence-based, safe and high-quality care. Nurses must contribute to a training program that ensures they have the knowledge and skills necessary to provide high-quality nursing care. Nursing competency can have a direct impact on the optimistic effects of patients and reduce costs for the healthcare organization. Interventions can be developed to facilitate transitions and provide support to ensure, experience, and better outcomes **(Casafont et al., 2020).**

By looking to socio demographic data, it was found that the majority of the nurses aged 22-27 yrs. and more than three quarters had diploma / technical institute nurse; whereas the majority of them worked for between one and five years. These results did not support the results of **Nemati et al. (2020),** as more than three quadrants of them did not participate in any Covid 19 training programme in a study titled "Assessing Iranian nurses' awareness and stress regarding COVID-19 during the current outbreak in Iran" featured the nurses as contributors. Most of the nurses were younger than 40 years old. In terms of educational attainment, more than half had associate or bachelor's degrees, with even fewer having master's degrees. More than a third of the sample of participants had less than five years of work experience.

Regarding the source of information, results of the present study revealed that near two thirds of the sample get their information from TV, Radio.

These results are consistent with **Huynh et al., (2020)** who found that social media and the Ministry of Health website were the primary sources of COVID-19 information for nurses.

On the other hand this disagreed with **Nemati et al., (2020)** found that the sources of information for the nurses were the World Health Organization and the Ministry of Health and media. This might indicate that the Egyptian media and television are motivated to raise Egyptians' knowledge of the Covid 19 outbreak in order to stop the disease's spread.

In the current study, nurses revealed a highly significant difference in relation to their level of knowledge pre versus post applied training program at P= 0.0001, these findings agreed with **Joshi et al., (2020)** who reported that generally, three quadrants of nurses demonstrated strong understanding and awareness of COVID-19 following the training program. Additionally, Abdollahpour & Khadivzadeh (2020) who found that enhancing the standard of care during pregnancy and delivery, as well as teaching, assisting, and training healthcare personnel in controlling infection epidemics, need to be prioritised complement these findings; so implementing training program to enhance competence level regarding COVID 19 prevention is essential to increase the knowledge and standard of care provided by nurses in various maternity outpatient facilities to keep themselves, their families, and their patients safe.

Additionally, these findings diverged from those of **Al Dossary et al. (2020),** who found that nurses with bachelor's degrees are more likely to be aware of COVID-19 and to take preventative measures than those with other educational backgrounds. This is to be anticipated since a bachelor's degree is often required for employment as a staff nurse. The

early patient monitoring, evaluation, and patient care towards recovery are the responsibilities of nurses with a bachelor's degree, whereas nurses with a master's degree occupy managerial and supervisory jobs.

The majority of the sample had competent practices post training program, according to the total scores of nurses, compared to pre-program, with a highly statistically significant difference at P = 0.0001. These results were in agreement with **Sahiledengle, (2019)** and CDC, (2020), who reported that all healthcare facilities that provide obstetric care must make sure that their staff members are properly trained and capable of implementing recommended infection control in obstetric settings. All members of the medical team should make sure they are aware of and capable of adhering to the Covid-19 infection control guidelines. **Al-Dossary, et al. (2020)** observed increased preventative practices for dealing with COVID-19 post intervention.

There was a positive correlation between nurses' knowledge and their age, educational level, and years of experience, according to research on the socio demographic data of nurses and their degree of knowledge and practice.

These findings supported those of **Namati et al. (2020),** who reported a highly statistically significant positive association between knowledge and socio demographic characteristics (age, education, and experience) both before and after the program. p<0.001. Furthermore, these results are consistent with **Asif's (2019)** study, which indicated that nurses with a bachelor's degree had superior

prevention and perception of COVID-19 compared to nurses with different educational backgrounds. Additionally, nurses with master's degrees perform better in clinical jobs and have greater clinical competence and knowledge than nurses with bachelor's degrees.

On the other hand, results of **Nemati, et al., (2020)** didn't match the current findings found that the total knowledge score was not affected by age and education level and it was not significantly different between nurses with less or more work experience. Also contradicts with **Kamineni, et al., (2020)** and concluded that here was no significant relationship between levels of knowledge with their socio demographic variables age, gender, education.

Additionally, the current study demonstrated a favourable fair relationship between nurses' practises and their age and years of experience at P=0.004 and P=0.006 pre and post program implementaion, respectively. These findings are consistent with those of Al Dossary et al., (2020), who discovered a highly significant correlation between practise and demographics (education, experience, and job) pre- and post-program; p value <0.001. In contrary **Amanya (2020),** observed that there was no statistically significant association between health professionals' socio-demographic variables, such as age, sex, education level, employment, working hours, and work experience, and their awareness of or compliance with the Covid-19 standard.

Based on the results obtained in the present study, there is a positive relation between knowledge and practices after a training program. This is in line with the findings of **Mbachu et al. (2020),** who discovered that there is a substantial association between knowledge and practise, suggesting that all health workers' knowledge has to be increased to increase the usage of preventative practices.

Conclusion

Based on the above mentioned. It could be concluded that offering nurses a training program on COVID-19 is beneficial in enhancing knowledge and competency based on the aforementioned information. A favourable association between nurses' knowledge and their age, education, and years of experience was also found. Moreover, there is a strong correlation between knowledge and competency following training.

Recommendations

Applying competency training programs for whole nursing staff in different health setting to enhance competency level regarding covid19 prevention.

References

Abdel Wahed, W.Y., Hefzy, E.M. Ahmed, M.I. and Hamed, N.S. (2020): Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt, J Community Health. 2020, Available at https://www.researchgate.net/publication /342754066_Assessment_of_Knowledge _Attitudes_and_Perception_of_Health_C are_Workers_Regarding_COVID19_A_ Cross- Sectional_Study_from_Egypt

Abdollahpour sedigheh, khadivzadeh: (2020): Improving the quality of care in pregnancy and childbirth with

coronavirus (COVID-19): a systematic review.

Al-Dossary, R. Alamri, M., Albaqawi, H., Al Hosis,K.Aljeldah, M.,Aljohan, M, Aljohani, K.,Almadani, N., Alrasheadi, B., Rawaih Falatah, R., and Almazan, J. (2020): Awareness, Prevention, and Perceptions of COVID-19 Outbreak among Nurses in Saudi Arabia, Int J Environ Res Public Health. 2020 Nov; 17(21): 8269.

Amanya, S., Nyeko, R., Obura, B.,Acen,J., Nabasirye, C., Oyella, F.,Afayo,V.,& Okwir,M., (2020) Knowledge and Compliance with Covid-19 Infection Prevention and Control measures among Health Workers in Regional Referral Hospitals in Northern Uganda: A cross-sectional Online Survey, available athttps://assets.researchsquare.com/files/rs- 63627/v1/81d68abe-50a4-41c4-872ac5b50e4b6762. Pdf

Asif, M.; Jameel, A.; Hussain, A.; Hwang, J.; Sahito, N. (2019): Linking Transformational Leadership with Nurse-Assessed Adverse Patient Outcomes and the Quality of Care: Assessing the Role of Job Satisfaction and Structural Empowerment. Int. J. Environ. Res. Public Health 2019, 16, 2381.

Casafont C , Núria F, Paula R (2020): Experiences of nursing students as healthcare aid during the COVID-19 pandemic in Spain: A phenomenological research study; Nurse Education Today 97(3):104711
DOI:10.1016/j.nedt.2020.104711.

Centres For Disease and Control (CDC) (2020): Considerations for Inpatient Obstetric Healthcare Settings availableathttps://www.cdc.gov/coronavirus/2019- ncov/hcp/inpatientobstetric-healthcare- guidance.html

Choi K.W., Kim Y., Jeon H.J. (2020): Perception and Conceptual Consideration

of Health Care Workers Regarding COVID19 . Adv. Exp. Med. Biol. 2020;1191:219–235. doi: 10.1007/978-981-32-9705-0_14.

Daniele Donati ,Valentina Biagioli, Claudia Cianfrocca, Maria Grazia De Marinism and Daniela Tartaglini: (2019) Standard Precautions among Clinical Nurses. Int. J. Environ. Res. Public Health 2019, 16 (1), 121;https://doi.org/10.3390/ijerph1601012.

García-Martín M, Roman P, Rodriguez-Arrastia M, DiazCortes MD, Soriano-Martin PJ, Ropero-Padilla C. (2020): Novice nurse's transitioning to emergency nurse during COVID-19 pandemic: aqualitative study. Journal of Nursing Management.2020. 4(2):34–42. https:// doi.org/10.1111/jonm.13148

Goh, K. J. , Wong, J. , Tien, J.-C. C. , Ng, S. Y. , Duu Wen, S. , Phua, G. C. , & Leong, C. K.-L. (2020). Preparing your intensive care unit for the COVID-19 pandemic: Practical considerations and strategies. Critical Care (London, England), 24(1), 215. 10.1186/s13054-020-02916-4

Hassan. Z.M. (2018), Improving knowledge and compliance with infection control Standard Precautions among undergraduate nursing students in Jordan American Journal of Infection Control, 46 (3) pp. 297-302, 10.1016/j.ajic.2017.09.010

Hui DS, I Azhar E, Madani TA, . (2020): nCoV epidemic threat of novel coronaviruses to global health: the latest 2019 novel coronavirus outbreak in Wuhan, China [published January 14, 2020]. Int J Infect Dis. 2020;91:264-266. doi:10.1016/j.ijid.2020.01.009

Huynh G, Nguyen TNH, Tran VK, Vo KN, Vo VT, and Pham LA. (2020): Knowledge toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. Asian PacJTrop Med

2020; 13. doi: 10.4103/1995-7645.280396.

Joshi, K.P., Madhura, L., and Jamadar, D. (2020): Knowledge and awareness among nursing students regarding the COVID-19: a cross sectional study, International Journal of Community Medicine and Public Health 2020 7(6)1:4 available at https://www.researchgate.net/publication/34195 1661_Knowledge_and_awareness amongnursing_students_regarding_the_COVID- 19_a_cross_sectional_study.

Kamineni, S.R.T., Balu, P., Sivagananam, P.,Chellapandian, P., Chelladurai,U.M.,Jayasheelan, V.P., Bopaiah,S.K.,Ravikumar,D.,Myneni, S., and Mohan,S.K. (2020). Knowledge of COVID-19 among nursing and Allied healthcare professionals working intertiary care hospital. International Journal of Research in Pharmaceutical Sciences, 11(SPL1),103-109. https://doi.org/10.26452/ijrps.v11iSPL1.2233

Kohrt B.A, Asher, L., Bhardwaj A., Fazel, M., Jordans M.J.D, Mutamba B.B., Nadkarni A., Pedersen, G.A., Singla D.R., and Patel, V. (2018): The role of communities in metal health care in low and middle income countries; a meta review of components and competencies; International journal of environmental research and public health 15.

Mbachu, C.N.P., Azubuike C.M.C., Mbachu, I.I. Ndukwu,C.I, Ezeuko, A.Y.A., Udigwe,I.B, Nnamani, C.P., Umeh,U.M., Ezeagwuna, D.A., Onah,S.K. Eze,H.O Okereke, U.C., and Orji- Ifeanyi, E.N. (2020): COVID-19 infection: Knowledge, attitude, practices, and impact among healthcare workers in a South-Eastern Nigerian state J Infect Dev Ctries 2020; 14(9):943-952. doi:10.3855/jidc.13248.

Nemati, M., Ebrahimi,B. and Nemati, (2020): F. Assessment of Iranian Nurses' Knowledge and Anxiety Toward COVID-19 During the Current Outbreak in Iran, Arch Clin Infect Dis, 2020 In Press:e102848.Available at https://www.researchgate.net/publication/340278359_Assessment_of_Iranian_NurseKnowledge and_Anxiety_Toward_COVID 19_During_the_Current_Outbreak_in_Iran.

Nguyen, T.M.; Zhang, Y.; Pandolfi, P.P. (2020): Virus against virus: A potential treatment for -nCov (SARS-CoV-2) and other RNA viruses. Cell Res, 30, 189–190. [Google Scholar] [CrossRef] [PubMed][Green Version]

Sahiledengle, B. (2019): Decontamination of patient equipment: nurses' self-reported decontamination practice in hospitals of southeast Ethiopia, BMC Research Notes (2019)12(1),392. https://www.researchgate.net/publication/334431280_Decontamnation_of_patient_equipment_nurses'_

selfreported_decontamination_practice_in_hospitals_of_southeast_Ethiopia

Srichan P, Apidechkul T, Tamornpark R, Yeemard F, Khunthason S, Kitchanapaiboon S, et al. (2020). Knowledge, Attitude and Preparedness to Respond to the 2019 Novel Coronavirus (COVID-19) Among the Bordered Population of Northern Thailand in the Early Period of the Outbreak: A Cross-Sectional Study. SSRN Electronic Journal. 10.2139/ssrn.3546046

World Health Organization. 2019-nCoV outbreak is an emergency of international concern. 2020 [cited 2020 June 02]. Available from: http://www.euro.who.int/en/health-topics/health-emergencies/internationa....

Zegarra A, Chino B, Ames R. Knowledge, perception and attitudes in Regard to

COVID-19. Pandemic in Peruvian Population. 2020. 10.31234

Zhong, B., Luo, W., Li, H., Zhang, Q., Liu, X., Li W., Li, Y. (2020). Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int. J. Biol. Sci. 2020; 16(10): 1745-1752.

Zhou M, Tang F, Wang Y, et al. (2020): Knowledge, attitude and practice regarding COVID-19 among health care workers in Henan, China. J Hosp Infect.; S0195-6701(20)30187-0. 10.1016/j.jhin.2020.04.01.

Zhu, N. , Zhang, D. , Wang, W. , Li, X. , Yang, B. , Song, J. , Zhao, X. , Huang, B. , Shi, W. , Lu, R. , Niu, P. , Zhan, F. , Ma, X. , Wang, D. , Xu, W. , Wu, G. , Gao, G. F. , Tan, W. , & China Novel Coronavirus Investigating and Research Team . (2020). A novel coronavirus from patients with pneumonia in China, 2019. The New England Journal of Medicine, 382(8), 727–733. 10.1056/NEJMoa200101.