

Impact of Educational Intervention on Nurses' Knowledge, Practice and Attitude Related Prevention Measures of COVID 19

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Abstract

Background: The COVID-19 pandemic has not only caused highly significant challenges for health systems over the world, but also fueled a surge in misinformation. Nurses as the first member at health team must improve their performance about COVID-19 **Research Aim:** to assess impact of educational program on nurses' knowledge, practice and attitude related prevention measures of COVID 19 **Methodology:** A Quasi-experimental research design was utilized from July 2020- November 2020 conducted at Shebin El Koum teaching Hospital and Menofia University Hospital for 50 nurses. A self-administered questionnaire containing four parts (characteristics, knowledge part, Attitude Rating Scale and nurses' practice) **Results:** The present study showed mean age of studied nurses was 34.80±4.99 years and 52% of them providing care for COVID-19 patients. 70% of them had poor knowledge at pre intervention, while 76% of them had good knowledge at post intervention and only 6% had poor knowledge. Mean score of studied nurses related total attitude at pre intervention was 13.70±3.45, while at post intervention was 25.18±3.66. Total practice, showed that 36% of nurses had competent practice while 90% of them had competent practice at post intervention with p value <0.01 **Conclusions:** To conclude, the present study reported that educational training program had positive effect on nurses' knowledge, attitude and practice so hypothesis was accepted.

Keywords: Knowledge, Attitude, Practice, Preventive Measure, COVID19

Introduction

Coronavirus disease-2019 (COVID-19) is an infectious disease due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Firstly time diagnosed at December 2019 in Wuhan, which capital

of China, and has since spread over world and lead to the ongoing 2019–20 coronavirus pandemic⁽⁵⁾

As last second week of November 2020, more than 62 million cases have been reported across 220 countries and territories and more than 1.400.000 deaths⁽²⁵⁾

As of the evening of November 29, there were 115.000 affirmed cases of COVID-19 and 6.600 deaths in Egypt. The 2020 coronavirus widespread in Egypt is a portion of a continuous around the world coronavirus widespread. The primary cause of COVID-19 in Egypt was affirmed on 14 February 2020⁽¹⁴⁾

So far, no effective treatment or vaccine has been described. Therefore, applying the preventive measure

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to control spreading COVID-19 infection is the greatest critical intervention ⁽²⁷⁾. Controlling the virus by stopping its transmission to protect millions of lives demands multi-pronged approaches with key methods like contact tracing, nationwide lockdown, improving quarantine arrangements for people at risk of infection ^(26, 4).

Nurses considered as frontline health care team, must equipped with the furthestmost recent research outcomes and precise information, which used for providing care and connected to at-risk populations or patients. Prior studied research about infectious diseases issues with pandemic potential reported that lack of knowledge leads to inappropriate treatment and control activities ^(12, 22)

Aims

The study aimed to assess impact of educational program on nurses' knowledge, practice and attitude related prevention measures of COVID 19, through:

- Assess nurses' knowledge, practice and attitude related prevention measures of COVID 19
- implement educational program for nurses about prevention measures of COVID 19
- Evaluate impact of educational program on nurses' knowledge, practice and attitude related prevention measures of COVID 19

Research hypothesis:

H₁: Educational program had positive impact on nurses' knowledge, practice and attitude related prevention measures of COVID 19

Methods

Research design: A Quasi-experimental research design was utilized from July 2020- November 2020.

Research Setting: This study was conducted at Shebin El Koum teaching Hospital and Menofia University Hospital.

Subjects: A convenience sample of 50 nurses worked at previous mentioned setting, regardless their age, gender, years of experience and educational level.

Sample size:

The sample size calculated based on a study carried out by **Morkes**,¹⁵. Based on the mean of knowledge pre 76.41±22.14 and post was 90.9 and statistical power of 95%, level of confidence (1-Alpha Error): 95%, Alpha 0.05, Beta 0.05. The minimal sample size was 34 nurses

Data Collection:

Data was collected through a self-administered questionnaire translated to Arabic language, tool containing four parts:

Part I: Nurses' characteristics such as age, gender, marital status, educational level, experience, training course and providing care for COVID-19 patients.

Part II: It was concerned with the knowledge of nurses such as Definition of COVID 19, Causes of COVID19, Risk factors, Signs and symptoms, Complication, Diagnostic measures, Route of transmission, Medical management, Level of personal protection, Ways of preventive spreading disease, Personal protective equipment, Medical waste disposal. It was adapted from **Gharpure et al.**,⁸. The right answer was scored as a single point and the wrong answer was scored as a zero point. These scores was summed and converted into a percent score. It was classified into 3 categories: Good knowledge if score > 70%, Average knowledge if score from 50 - 70% and Poor knowledge if score <50%.

Part III: Attitude Rating Scale:

Modified likert rating scale to assess the attitude of the nurses toward prevention of COVID-19 as I think COVID-19 disease causes stigma, I do not think the seriousness of COVID-19 disease, COVID-19 never controlled successfully over world, It is difficult to protect ourselves from infection...etc. It was nine items and it adapted from **Salman et al.**,²⁰. Each statement was assigned a score according to nurses' responses and attitude; they were classified to positive and negative attitude. Responses was "agree", "sometimes", "disagree" and was respectively scored 3, 2 and 1. The scoring was reversed for negative statements; the scores of the items were summed up and were converted into a percentage score. It was classified into 2 categories; Positive attitude if score ≥ 70% and Negative attitude if

score < 70%.

Part IV: Nurses' practice:

It was concerned with the practice of nurses to ward COVID19 such as Hand washing procedure, Alcohol based hand rub, Gowning, Gloving, Wearing surgical mask, Safety precaution for nurses during providing care for COVID19. It was adapted from **McIntosh et al.**,¹³. The right answer was scored as a single point and the wrong answer was scored as a zero point. These scores was summed and converted into a percent score. It was classified into 2 categories; competent practice if score > or equal 80% and incompetent practice if score <80%.

Assessment phase:

As well as during the 1st round of training the researchers clarified the aim of the study and the tools components. The pre designed questionnaire was distributed on studied nurses for filling their characteristics, knowledge and attitude and observed the nurses at training lab by using predesigned checklist to assess their practice (pre and post intervention). The educational program prepared and designed according to the nurses' level of knowledge, attitude and practice related COVID19, and researcher prepared it after review multi literature review about COVID19 and ways of prevention (**Fiorino et al.**,⁷; **Lahiri et al.**,¹¹).

Intervention and evaluation phase:

Researcher divided studied nurses into five groups each one group trained at four rounds of training each one about one-hour sessions in form of work shop and Q&A sessions with the researcher, using speech and pamphlets. The studied nurses were informed about the group to which they were enrolled via an invitation letter with training plan detected the time and place of training. These one-hour rounds were conducted two days per week (12-1 a.m.) and were as follows:

First round training: The studied nurses were introduced to each other and were informed about the method and structure of the round. The nurses' expectations from the education program were identified.

Second round training: Definition of COVID 19, Causes of COVID19, Risk factors, Signs and symptoms, Complication and Diagnostic measures were trained and

discussed.

Third round training: The studied nurses were acquainted with the Route of transmission, Medical management, Level of personal protection, Ways of preventive spreading disease, Personal protective equipment and Medical waste disposal.

Fourth round training: Studied nurses were informed and trained through demonstration and re demonstration about Hand washing procedure, Alcohol based hand rub, Gowning, Gloving, Wearing surgical mask, Safety precaution for nurses during providing care for COVID19. By the end of every round training, the participants' names were written down. The sessions ended after responding to the subjects' questions. The educational slides, papers, and charts were presented to the participants for practice and learning.

A group of experts in the critical and medical surgical nursing departments ascertained the content's validity; their opinions were elicited regarding the format, layout, consistency, accuracy, and relevancy of the tools. Reliability testing was carried out to test the reliability in terms of Cronbach's Alpha for tool was 0.799.

Data collected from the studied sample was revised, coded, and entered using Personal Computer (PC). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 24. A t-test is a type of inferential statistic used to determine if there is a significant difference between the means. Pearson's correlation coefficient is the test statistics that measures the statistical relationship, or association, between two continuous variables.

Ethical Considerations:

Each nurse was informed about the purpose and benefits of the study in the first part before participation at the study, where every one can't be starting the questionnaire without consent to participate in data collection in the current study. The nurse were assured that all data was used for research purpose only and each one was informed of the rights to refuse participation in the study or withdraw at any time before completing the questionnaire with no consequences.

Results

Table (1) revealed that mean age of studied nurses was 34.80 ± 4.99 years, 76% of them were female and 62% of them were married. Related educational level, 56% of them had technical health institute. Also, showed that mean of years' experience was 14.5 ± 5.78 years, 12% of them attended training courses and 52% of them providing care for COVID-19 patients.

Table (2) there was highly significant difference between studied nurses related correct answers about knowledge questions at pre and post intervention at p value <0.01 .

Figure (1) reported that 10% of studied nurse had good knowledge and 70% of them had poor knowledge at pre intervention, while 76% of them had good knowledge at post intervention and only 6% had poor knowledge.

Table (3) revealed that mean score of studied nurses related total attitude at pre intervention was 13.70 ± 3.45 ,

while at post intervention was 25.18 ± 3.66 with highly significant difference at p value <0.01 . Also, there was slight significant difference between mean score pre and post intervention related seriousness of COVID-19 disease at p value <0.05 .

Table (4) demonstrated that 50% of studied nurses had competent practice related wearing surgical mask, while 98% of them had competent practice at p value <0.01 . According total practice, showed that 36% of nurses had competent practice while 90% of them had competent practice at post intervention with p value <0.01 .

Table (5) showed that there was highly positive correlation between nurses' knowledge with attitude and practice at p value <0.01 . Also, revealed that there was highly positive correlation between nurses' practice and their attitude level at p value <0.01 .

Table (1) Distribution of studied nurses related their characteristics (n=50).

Items	N	%
Age		
20 – <30	13	26
30 - <40	25	50
40- 50	12	24
Mean SD	34.80 ± 4.99	
Gender		
Male	12	24
Female	38	76
Marital status		
Married	31	62
Not married	19	38
Educational level		
Diplom	11	22
Technical health institute	28	56
University	8	16
Postgraduate	3	6

Cont... Table (1) Distribution of studied nurses related their characteristics (n=50).

Experience		
1 – <10	14	28
10 - <20	23	46
20 – 30	13	26
Mean SD	14.5±5.78	
Training courses about COVID-19		
Yes	6	12
No	44	88
Providing care for COVID-19 patients		
Yes	26	52
No	24	48

Table (2) Compare between studied nurses at pre and post intervention related knowledge score (n=50)

	Correct pre		Correct post		T test	P value
	n	%	n	%		
Definition of COVID 19	38	76	50	100	8.996	<0.01
Causes of COVID19	26	52	47	94	10.25	<0.01
Risk factors	18	36	48	96	9.668	<0.01
Signs and symptoms	29	58	49	98	9.758	<0.01
Complication	17	34	47	94	11.02	<0.01
Diagnostic measures	20	40	46	92	9.117	<0.01
Route of transmission	40	80	50	100	7.164	<0.01
Medical management	23	46	50	100	8.446	<0.01
Level of personal protection	21	42	47	94	11.76	<0.01
Ways of preventive spreading disease	34	68	49	98	10.45	<0.01
Personal protective equipment	24	48	48	96	7.159	<0.01
Medical waste disposal	22	44	46	92	8.306	<0.01

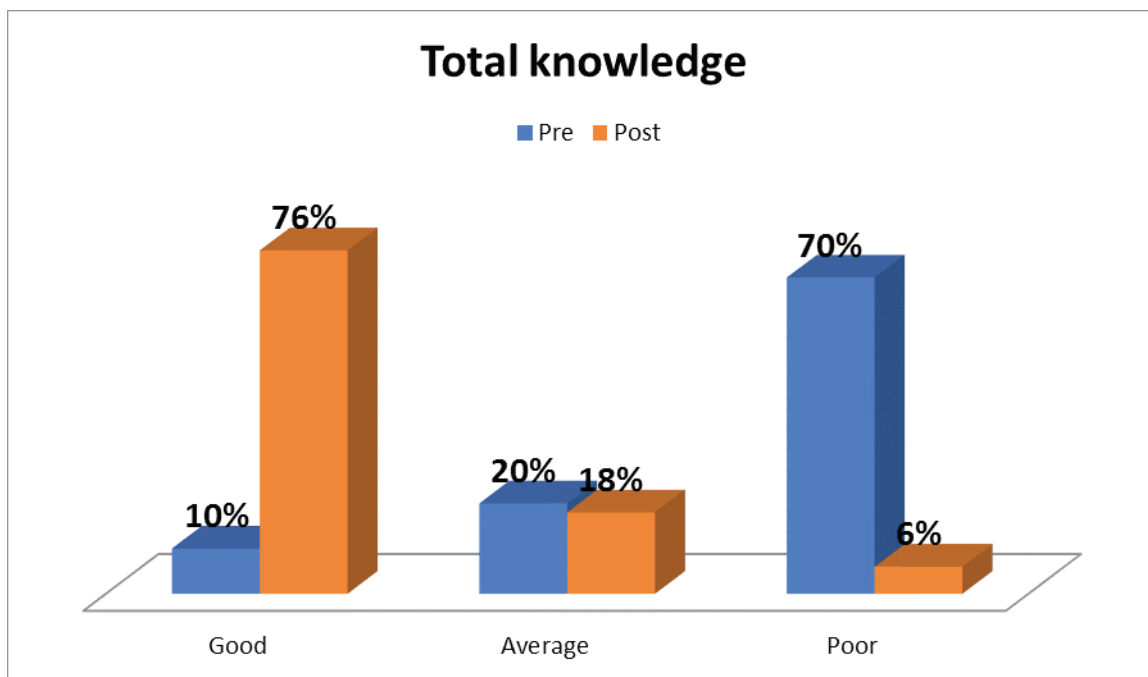


Figure (1) Distribution of studied nurse related total knowledge at pre and post intervention (n=50).

Table (3) Compare between studied nurses at pre and post intervention related attitude of nurses about COVID 19 prevention (n=50) 1-2-3

	pre	post	T test	P value
	Mean SD	Mean SD		
I think COVID-19 disease causes stigma	1.56±0.77	2.71±0.82	7.965	<0.01
I do not think the seriousness of COVID-19 disease	2.40±0.24	3.00±0.00	4.101	<0.05
COVID-19 never controlled successfully over world	1.33±0.63	2.69±0.47	10.223	<0.01
If I have symptoms that resemble those of COVID-19, I do not contact with the doctor	1.19±0.58	2.85±0.51	9.468	<0.01
It is difficult to protect ourselves from infection	1.14±0.45	2.82±0.63	11.28	<0.01
I refuse to participate in the provision of nursing service for COVID 19 patient	1.73±0.62	2.79±0.80	10.99	<0.01
Nurses have an active role in educating the community on how to prevent the spread of COVID19	2.04±0.36	2.96±0.64	9.786	<0.01
I adhere to protective personal precaution inside and outside the hospital	1.31±0.27	2.61±0.28	10.55	<0.01
I am very concerned about transmitting the infection to one of my family members	1.40±0.71	2.75±0.35	9.117	<0.01
Total attitude	13.70±3.45	25.18±3.66	14.503	<0.01

Table (4) Compare between studied nurses at pre and post intervention related practice score (n=50)

	Competent pre		Competent post		T test	P value
	n	%	n	%		
Hand washing procedure	22	44	45	90	10.64	<0.01
Alcohol based hand rub	23	46	46	92	9.715	<0.01
Gowning	19	38	44	88	9.968	<0.01
Gloving	20	40	46	92	11.45	<0.01
Wearing surgical mask	25	50	49	98	8.675	<0.01
Safety precaution for nurses during providing care for COVID19	17	34	48	96	10.28	<0.01
Total practice	18	36	45	90	17.05	<0.01

Table (5) Correlation between studied variable at pre intervention

	Knowledge	Attitude	Practice
Knowledge		r. 0.641 p .000**	r. 0.599 p .001**
Attitude			r. 0.488 p .006**
Practice			

Discussion

Health workers, especially nurses, have close contact with infected patients and have a decisive role in infection control (Lababidi et al., 2020), so therefore, nurses more urgent to improve their level of knowledge and practices on how to avoid infection and prevent spreading of COVID19.

After analyzing and interpretation of the collected data, the current study demonstrated that one tenth of studied nurse had good knowledge and more than two thirds of them had poor knowledge at pre intervention, while slightly more than three quarters of them had good knowledge at post intervention and less than one tenth had poor knowledge. Also, mentioned that mean score of studied nurses related total attitude at pre intervention

was 13.70 ± 3.45 , while at post intervention was 25.18 ± 3.66 with highly significant difference at p value <0.01 . Related nurses' practice, demonstrated that more than one third of nurses had competent practice while the most of them had competent practice at post intervention with p value <0.01 . These results may due to effective of educational program which prepared dependent on pre assessment level of nurses, used effective teaching and illustrative methods, allow to nurses to provide feedback at end of each round training and educational slides, papers, and charts were presented to the participants for practice and learning.

These results supported with the study conducted by Elgzar et al.,⁶ who reported that post intervention, significant differences ($p < 0.05$) were observed between control and intervention groups in their awareness

and all health belief model constructs regarding COVID19. Also, cohort with the study by **Ayed et al.**,³ who stated significant difference between secondary students' knowledge practice and attitudes, pre and post educational program intervention and consistent with the study performed by **Semerci et al.**,²³ who presented that less than half of the nurses received education for COVID-19 and regular with **Amer & Mohamed**,² who reported that there were statistically significant differences in total mean score of knowledge pre and post nursing instructions. Also, agreement with the study done by **Saqlain et al.**,²¹ who reported that health care workers had poor knowledge regarding transmission of COVID19 (40.6%, $N=168$) and need educational program. And, **Ros & Neuwirth**,¹⁹ stated that training tutorials had positive effect on health worker awareness.

But, disagreement with the study by **Huynh et al.**,⁹ who reported that at pre intervention the majority of health team workers, had positive attitude and good knowledge related COVID-19. Also, not similar with the study performed by **Aharon et al.**,¹ who detected that Nurses' knowledge pre educational program of COVID-19 preventative behaviors was significantly higher than that of layperson. And, **Nemati et al.**,¹⁶ who showed that studied nurses had almost good knowledge related COVID-19 at pre assessment.

Another important finding was there was highly positive correlation between nurses' knowledge with attitude and practice at p value <0.01 Also, revealed that there was highly positive correlation between nurses' practice and their attitude level at p value <0.01 . These results supported with the study performed by **Papagiannis et al.**,¹⁸ indicating that studied subjects with a good knowledge verified a positive perception and would practice more preventive measures. Attitudes score was significantly associated with practices score ($p = 0.009$). Also, regular with the study performed by **Wahed et al.**,²⁴ who stated that A positive correlation between knowledge and attitude scores was detected ($r=0.215$, $p<0.001$). And, **Oh**,¹⁷ who detected that perception, attitude, and role model scores of ICNs were significant predictors of performance of health care workers.

Conclusion

To conclude, the present study reported that

educational training program had positive effect on nurses' knowledge, attitude and practice so hypothesis was accepted. Also, There was highly significant correlation between knowledge, attitude and practice at p value <0.01 .

Conflict of Interest: Not present any conflict

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