

Effect of Online Education on Critical Care Nurses' Knowledge and Attitude about End-of-Life Care for Covid-19 Elderly Patients

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Abstract

Background: End-of-life care (EOLC) is a continuum of palliative care for elderly COVID-19 patients which need more education. Critical care nurses earned benefits from an online education to improve their knowledge and attitude regarding several kinds of practice. **Aim of the study:** evaluate the effect of online education on critical care nurses' knowledge and attitude about end-of-life care for covid-19 elderly patients. **Design:** A quasi-experimental research design (pre/post-test). **Sample:** Convenient sample included 90 registered nurses who assigned to work at critical units of the isolation University Hospitals, Cardiothoracic, Renal, and Liver Hospital at Minia University, Minia City, Egypt. **Results:** critical care nurses' Mean \pm SD of age were (24.2 \pm 2.9) and (58.9%) of them were female. It was noticed that (20%) of the nurses had satisfactory knowledge about EOLC for Covid-19 elderly patients at pretest and increased to (94.4%) at posttest. High percentage of nurses had negative attitude about EOLC at pretest (86.7%) but at the post test (100%) of their attitude changed to positive after the online education. **Conclusion:** The present study concluded that online education improved critical care nurses' knowledge and positively improved their attitude about EOLC for the COVID-19 elderly patients. **Recommendations:** Critical care nurses need formal online education about the importance of EOLC for the elderly COVID-19 patients.

Keywords: End of life, COVID-19, Elderly, Online Education, and Critical Nurses.

Introduction

Due to age-related physiological changes and previous comorbid illnesses such as cardiovascular disease, diabetes, and pneumonia, the new coronavirus SARS-CoV-2 (COVID-19) is a global health hazard for elderly people, who have a considerable chance of acquiring severe life-threatening illness (Marwa, et al., 2020).

Critical care nurses (CCN)' play an important role in providing end-of-life care (EOLC) to elderly patients. When a patient reaches the end stage of life, palliative EOLC is essential component of his/her care. Comfort, dignity, psychological/spiritual requirements, and family support are all important considerations (Pachchigar, et al., 2021). Because of the isolation and restricted family contact with covid-19 elderly patients, the dying process cannot be planned, while patient-family centered care is even more critical (Negro, et al 2020).

Palliative EOLC need to be maintained for elderly covid-19 patients because of the severe manifestations as dyspnea, pain, and other symptoms they have. Such palliative care

includes, breathing exercise, positioning, and relaxation and meditation technique. Critical care nurses are frequently underprepared, which contributes to unfavorable attitudes toward dying elderly covid-19. Palliative EOLC that delivered successfully should include a combination of knowledge and attitudes. (Etafa, et al., 2020).

An online education or distance learning were first established in rich countries, then lower and middle-income countries following the Covid-19, when many colleges were closed (Cassum, et al., 2020). Critical care nurses could use an online educational method to strengthen and polish their existing skills and knowledge, resulting in better care quality. Furthermore, nurses work in different shifts and do not have the opportunity to engage in face-to-face educational sessions, continuing education and upgrading their knowledge and skills. Online educational models have arisen as a new way for nurses to receive ongoing education (Abd Elaziz, et al., 2021).

The Covid-19 pandemic has drastically affected the level of nursing care provided in intensive care units (ICU), as well as the

educational methods employed. EOLC for elderly covid-19 was also impacted since, more than before. ICU staff who may not be experts in this field are interacting with patients who are dying or whose condition is fast deteriorating (Ersek, et al., 2021). However, landmark studies in recent decades have emphasized the improvement in ICU level of care, but the low quality of the EOLC in ICUs requires additional support, particularly during the Covid-19 pandemic (Tang, et al., 2020).

Significance

The Centers for Disease Control and Prevention (CDC) in the United States revealed that severe covid-19 infections account for 31% and 80% of mortality in adults aged 65 and older, respectively. Covid-19 -related mortality increases with age, according to Chinese studies. In adults over the age of 80, a death rate of 14.8% has been documented (Liu, et al., 2021). According to (Ramos-Rincon, et al., 2021) 747 patients hospitalized with COVID-19 many of them suffers from EOL symptoms. 32.7% died in the ICU while only 44.1% of them received EOLC in the form of palliative sedation prior to death.

Covid-19 elderly patients who died in ICUs due to a lack of nurses-surrogate and prognostic EOLC discussions. Furthermore, patients and their families may not receive enough or timely palliative-psychological social-spiritual assistance, resulting in dissatisfaction with EOLC and deep psychological pain following bereavement (Balasubramanian, et al., 2018). The researchers viewed that, enhancing EOLC quality in ICUs has been identified as a top goal for improving critical care nursing quality in order to promote patients' and family members' death quality, which reduces bereavement grief.

Aim of the study:

Evaluate the effect of online education on critical care nurses' knowledge and attitude about end-of-life care for covid-19 elderly patients.

Research hypothesis:

Online education has positive effect on improving critical care nurses' knowledge and attitude about end-of-life care for Covid-19 elderly patients.

Operational Definition

End of life care (EOLC): a style that develops the quality of life of patients and their families facing problem associated with life-threatening illness, through the relief of grief by means of early identification and treatment of pain and other problems, physical, psychosocial and spiritual.

Online education: is a procedure of gaining skills and knowledge through electronic devices like computers, mobiles, laptops, etc using the internet.

Study design: a quasi-experimental research (pre/post-test).

Study Sample

Convenient sample of 90 registered nurses (RNs) (37 males and 53 female) whom were assigned to work at the ICUs of the selected isolation hospitals that were located at the Main University Hospitals, Cardiothoracic University Hospital, Renal and Urology University Hospital, and the Liver University Hospital all these hospitals were belonged to the Minia University, Minia City, Egypt.

The sample size was calculated based on Isaac & Michael, (1995) Formula which is computed as $(N=n \times 30/100)$ equation which include:

N =sample size

n =total number of 200 critical care nurses working in the previously mentioned hospitals during the period 2020:2021.

$N=200 \times 30/100=60$ nurse

Minimum Sample size: 60 nurse

Inclusion criteria

1. Nurses from both sex deals with elderly Covid-19 patients at isolation ICUs.
2. Have the ability to use the internet.
3. Agree to participate with the researchers.
4. Have smart phone or computer with an internet access.

Tools

Nurses' readiness to care for covid-19 elderly patients at their end of life stage was assessed using three tools. The first and second tools were self-designed questionnaires

constructed by the researchers after revising extensive relevant literatures review and in the light of related studies about EOLC for covid-19 elderly patients such as (Liu, et al., (2021), Eltaybani, Igarashi, & Yamamoto-Mitani, (2021), Santivasi, Partain, & Whitford, (2020). **Tool one: Critical care nurses' demographic characteristics** such as age, gender, educational qualifications and years of experiences of the critical unit nurses. **Tool two: Critical care nurses' knowledge about EOLC for elderly patients**, this questionnaire consisted of **two parts; Part one:** Assessment of Nurses' knowledge about EOLC for elderly covid-19, which composed of 11 questions with two possible responses included "true," or "false." **Part two:** Management of common symptoms affecting elderly covid-19 patients at EOLC, which contained 10 domains with two possible responses, included "true," or "false." Relieving dyspnea (5 items), pain management (4 items), fluid and nutritional needs (6 items), diarrhea (4 items), insomnia (3 items), delirium (5 items), EOL medications (4 items), ethical issues (5 items), communication (5 items), existential and spiritual issues (5 items)

The Scoring system

Each correct answer scored (1), while incorrect response scored (0). Score were calculated by adding the number of right answer, with a total possible score ranges from (0) to (57). The satisfactory knowledge more than (60 %) of the completed questionnaire and the unsatisfactory level of knowledge was less than or equals to (60%).

Tool three: Critical care nurses' attitude about EOLC for elderly patients measured the nurses' attitudes toward EOLC for covid-19 elderly patients, using FATCOD questionnaire this tool was adopted from the study of Frommelt Attitudes Toward Care of the Dying scale (FATCOD scale). FATCOD scale adopted from (Jo Wilson, et al., 2015) which consists of 30 items, with a 5 point Likert scale, i.e. 1 (Strongly Disagree), 2 (Disagree), 3 (Uncertain), 4 (Agree) to 5 (Strongly Agree). The FATCOD scale had 15 positive sentences are included in the following numbers (1, 2, 4, 10, 12, 16, 18, 20, 21, 22, 23, 24, 25, 27, and 30) and the 15 negative sentences are (3, 5, 6, 7, 8, 9, 11, 13, 14, 15, 17, 19, 26, 28, and 29). The previously mentioned

scores are reversed for the negative items (5 means strongly disagree) and (1 means Strongly Agree). The total scores ranges from 30 to 150. The positive attitude take score ≥ 50 from the total of [FATCOD] Scale. The negative attitude $<50\%$.

Ethical considerations

After examining the study protocol, the Ethics Committee of Faculty of Nursing at Minia University granted ethics approval. Following an explanation of the study goals during the face-to-face recruitment process, each participant gave verbal informed consent. Nurses had complete freedom to refuse or withdraw at any time. To protect participant anonymity and confidentiality, the questionnaire did not include any questions that could reveal their identities.

Validity and reliability: Five specialists in critical care nursing (2), medical surgical nursing (1), and gerontological nursing (2) assessed the tools' validity. Cronbach's-alpha test was used to determine tool reliability; it was 0.88 % for tool one and 0.95 % for tool two, respectively. To verify that the tools were clear, applicable, feasible, and relevant. A pilot study was conducted to test the tools applicability on nine nurses who were included in the current study because no changes had been made.

Field work

Preparatory phase

Included reviewing of the previous literature about the field of the current study to have a clear picture of all dimensions related to the topic. The researchers visited the selected University Hospitals prior to data collection to coordinate and establish the procedures for recruiting data collection, and the educational intervention. This phase assisted in guiding, planning, and developing the nursing procedure frame of the study.

Implementation phase

Data were collected during this phase throughout a three-months period from the beginning of April to the end of June 2021. ICU Nurses were approached in each of the previously selected University Hospitals to fill out the printed pre-test questionnaire during face-to-face interviews with the researchers. ICU nurses were given 20–30 minutes to complete all questions

included in the two previously mentioned tools in addition to the first tool (demographic data).

The researchers created an instructional package based on the pre-test results for determining the nurses' actual learning needs. An online link was created and given to the ICU nurses of the study via the social media web pages (face book and WhatsApp). All of the nurses surveyed were divided into three groups for considering their working shifts (30 nurse in each group). Educational intervention aimed to provide knowledge-based EOLC for covid-19 elderly patients in ICUs. It focused on knowledge and attitude issues that should be improved at the isolation ICU's hospital. Five theoretical online lectures were part of the online education. The first online lecture covered an overview of ageing populations as well as nursing considerations for elderly critical patients. The second and third lectures focused on covid-19 and the overall principles of infection control procedures for elderly. The fundamental EOLC for covid-19 elderly patients were covered in the fourth and fifth online lectures.

This educational model was delivered to nurses using a live broadcast Zoom meeting. Each lecture lasted one hour, the researchers began the session by giving a review of the prior one in 5 minutes. And 10 minutes included at the end of each presentation for questions and clarification. Over the course of three weeks, 5 hours were spent for each group with a total of 15 hours for all. For attracting the studied nurses, power point presentations, brain storming, questioning, and response were employed as teaching methods during each lecture.

Evaluation phase

Post-test was performed, after 6 weeks from completing the online educational intervention. The post-test was created online using the same questionnaires (tool two and three) of the pretest through Google form website. The post-test was designed that the participant cannot submit the test unless all questions were answered. And only one submission was allowed for each nurse included in the study, to prevent any duplication within the sample. The ICU nurses were invited to answer it and complete its submission through an online link. The online link was shared to all the ICU nurses included in the study through the same online social media web pages previously listed.

Limitation of the study

Conducting online education and follow up the studied nurses of different work shifts in different hospital locations was a limitation of the current study. The researchers overcome this point, through establishing an on-line education and make all educational material available at any time and follow-up for providing any clarification and explanation for the participants.

Furthermore, the use of self-report questionnaires may have led to overestimation of some of the findings due to variance, which is common in different methods

Results

Collected data were coded and processed using Statistical Package for Social Sciences version 20 (IBM Inc., Chicago, IL). Categorical variables were subjected to descriptive statistics. Test of association was done using Chi square, Fisher exact test, McNemar test, Phi and Cramer's V statistics at 5% level of significance. Test of correlation was done using Pearson correlation.

Table (1): shows that (57.8%) of the ICU nurses age between (20 > 25 years), In relation to gender it was found that (58.9%) were female. In relation to educational levels it was found that (55.6%) of studied nurses had Technical Institute of Nursing and (35.6%) were bachelor degree.

Table (2): found that nurses' knowledge regarding general EOLC issues for elderly Covid-19 Patients have highly statistical significant with Mean \pm SD in pretest were (6.61 \pm 1.64) but after posttest were (8.90 \pm 0.719). Regarding to ethical issues of the EOLC for elderly Covid-19 patients found highly statistical significant between Mean \pm SD in pretest (2.83 \pm 1.30), and posttest (4.45 \pm 0.501). Also the table shows statistical significance difference between the total knowledge Mean \pm SD presented by (P. value 0.001).

Table (3): Reveals a statistical improvement in nurses mean attitude score between pre and post implementing the online educational model (92.9 \pm 15.5 & 131.3 \pm 3.25) respectively

Table (4): the table shows a statistical significance correlation between nurses' knowledge and attitude after intervention presented by (P. value 0.019).

Fig (1): shows that only (5.6 %) from the ICU nurses had satisfactory **knowledge** Level about EOLC for Covid-19 Elderly Patients at pretest and increased to (80%) at posttest.

Figure (2): Illustrates high percentage of nurses had negative attitude about EOLC at pretest (86.7%) but at the post test (93.4%) of them their attitude changed to positive after the online educational module.

Table (1): Distribution of Studied Sample Regarding to Their Personal Characteristics (n=90).

Personal Characteristics	(n=90)	
	No.	%
Age / Years		
20 > 25	52	57.8
25 > 30	36	40
30 – 35	2	2.2
Mean ± SD	24.2 ± 2.9	
Gender		
Male	37	41.1
Female	53	58.9
Level of Education		
Bachelor's.	32	35.6
Technical Institute of Nursing.	50	55.6
Diploma of nursing.	8	8.9
Years of Experience		
> 1 year	41	45.6
1 > 5	43	47.8
5 - 10	6	6.7
Mean ± SD	3.31 ± 2.7	

Table (2): Mean Scores of Nurses' Knowledge Regarding EOLC for Elderly Covid-19 Patients Pre & Post of Online Education (n=90).

Variables	Pre-Test	Post-Test	P. value
General EOLC Issues for Covid-19 Elderly Patients.			
Mean ± SD	6.61 ± 1.64	8.90 ± 0.719	0.001**
Reliving Dyspnea for Covid-19 Elderly at EOLC.			
Mean ± SD	2.44 ± 1.90	4.05 ± 0.708	0.001**
Pain Management for Covid-19 Elderly Patients at EOLC.			
Mean ± SD	2.14 ± 0.868	3.27 ± 0.703	0.001**
Fluid and Nutritional Needs for Covid-19 Elderly at EOLC.			
Mean ± SD	3.48 ± 1.56	5.17 ± 0.552	0.001**
Diarrhea among Covid-19 Elderly at EOLC.			
Mean ± SD	2.33 ± 0.994	3.42 ± 0.496	0.001**
Insomnia in Covid-19 Elderly at EOLC.			
Mean ± SD	1.87 ± 0.832	2.62 ± 0.487	0.001**
Delirium in Covid-19 Elderly at EOLC.			
Mean ± SD	3.02 ± 1.22	4.07 ± .0737	0.001**
EOLC Medications' for Covid-19 Elderly.			
Mean ± SD	2.31 ± 0.978	3.47 ± 0.502	0.001**
EOLC Ethical Issues for Covid-19 Elderly patients.			
Mean ± SD	2.83 ± 1.30	4.45 ± 0.501	0.001**
Covid-19 Elderly patients EOLC Communications.			
Mean ± SD	3.13 ± 1.12	4.38 ± 0.512	0.001**
Existential and spiritual Issues for Covid-19 Elderly at EOLC.			
Mean ± SD	3.05 ± 1.26	4.13 ± 0.656	0.001**
Total Score	33.25 ± 6.75	48.22 ± 1.77	0.001**

** Highly Statistical significant ($P \leq 0.001$)

P value a: McNemar test

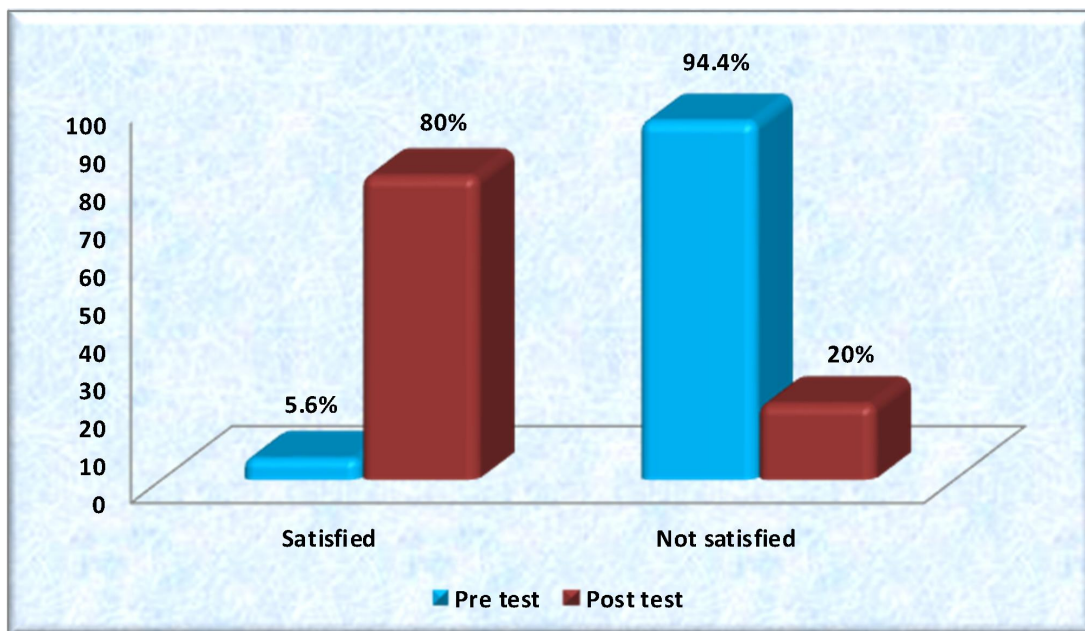


Figure (1): Frequency distribution of Nurses knowledge Level about EOLC for Elderly Covid-19 Patients Pre & Post Implementing the Online Education (n=90).

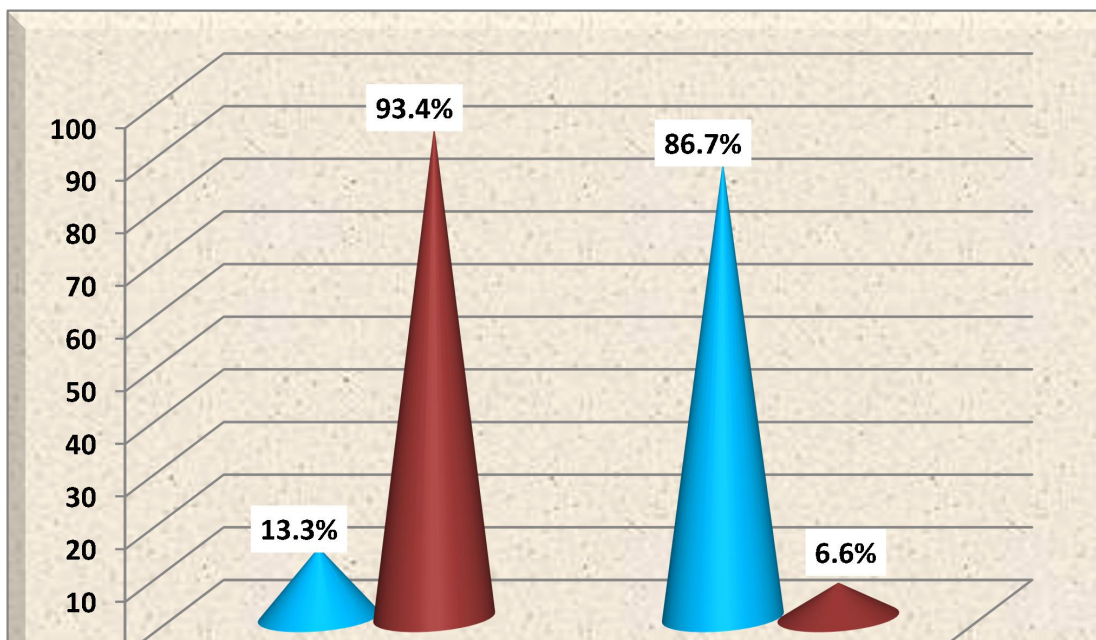


Figure (2): Nurses Attitude Regarding EOLC for Covid-19 Elderly Patients Pre & Post Implementing the Online Education (n=90).

Table (3): Comparison of total nurses' attitude regarding EOLC for covid-19 elderly patients (n=90).

Attitude	Pre-test	Posttest	P value
	92.9 ± 15.5	131.3 ± 3.25	0.001**

** Highly Statistical significant (P ≤ 0.001)

P value a: McNemar test

Table (4): Correlation between Level of Knowledge and Attitude of Nurses regarding EOLC for Covid-19 elderly Patients Pre and After Intervention (n=90)

Attitude	Knowledge			
	Pre		Post	
	R	p	R	P
	0.055	0.609	0.860	0.019*

* P- value is significant.

Discussion

End-of-life care is especially difficulty in critical care units during the time of crises with limited healthcare resources and the requirement for isolation measures, as demonstrated by the COVID-19 pandemic **Bollig et al., (2020)**. COVID-19 end-of-life care is a significant condition that affects people of all ages. Elderly people infected with COVID-19 need specific physical and psychological care during the last stage of their life **Desai, et al., (2020) & Wu, & McGoogan., (2020)**.

During the active dying phase, the ICU nurse's responsibility is to help patient and family by educating them on what to expect, answering their questions and concerns honestly, being a good listener, and providing emotional support and direction **Kim, et al., (2020)**. Since COVID-19 pandemic hit the world, nursing education has taken a hit. As a result, when employed in response to the pandemic, the online learning system had a significant impact on CCNs performance, with less face-to-face contact **Zendrato & Hiko, (2021)**. As a result, the goal of this study was to assess how an online instructional model affected CCN's knowledge and attitudes about EOLC for covid-19 elder patients.

Based on the result of the current study, it has been noticed that more than half of the CCNs age between was 20 > 25 yrs. with a mean age (24.2 ± 2.9), more than half of them were female and the educational categories of them were between bachelor and Technical Institute. This result is similar to **Zaghla et al., (2014)**, who found that the majority of the studied subjects were females, less than thirty years old with mean age (24.21±4.38). Also, our study on the same line with **Mohamed, et al.,(2020)**, that more than half of the studied sample were in age ranged between twenty- six

to thirty- five years with a mean age of (27.8±5.9).

The results of this study were compatible with previous studies in regard to nurses total knowledge score of all aspects of EOLC pre and post implementing the online educational program. This study illustrated that the CCN's total knowledge score significantly improved after implementing the online educational program during the pandemic. The researchers regarded this improvement to the positive effect of the implemented online educational model

These findings are in the same line with **Thanoon & Ali, (2021)**, who stated that mean score of knowledge of CCNs about the EOLC concept have elevated in posttest after educational program. Also **Hao, et al., (2021)** study identified that the knowledge of palliative care of participants could be improved significantly by an educational intervention. In addition, **Saylor, et al., (2016)** also agree with the present study they found that nursing knowledge level was significantly improved through palliative care using a simulation education method.

In contrast **Zeru, et al., (2020)** who assessed the knowledge and attitude towards palliative care and its associated factors among nurses in Tigray, and found that the more than half of nurses had good knowledge towards palliative care. The researcher regarded that the majority of studied nurses had attained a previous training about EOLC.

Regarding nurses' Attitude, it was found that the majority of ICU nurses had negative attitude toward EOLC for COVID-19 elderly patients before implementing the educational program compared to a clearly statistical significant positive change in attitude after the online education. The present study also showed highly statistical significant in

nurses' attitude regarding EOLC for COVID-19 elderly patients using FATCOD scale after an online educational program. The researchers regarded the nurses' negative attitude to their less experience level about this type of care. It is possible that persons with longer experience should had more positive attitude towards care of dying patients at the ICU. The CCN's attitude changed positively after the online educational program as the nurses' knowledge about EOLC increased which positively affected their attitude.

Jafari, et al., (2015) were in the same line to the present study and found that newly graduated nurses did not have positive attitudes toward EOLC. But the continuing in duty education affected their attitude to positive. Also, **Berndtsson, Karlsson & Rejnö (2019)** were in the same line with the study they showed statistical significant positive change in ICU nurse's attitude after an education and illustrated that their attitude correlated with the extent of theoretical education in palliative care.

Finally the current study documented that, the studied CCNs showed better improvement of their knowledge about EOLC post implementing the online education, in addition to a positive attitude toward following the EOLC for Covid-19 elderly patients which support completely the study hypothesis.

Conclusion

The present study concluded that online educational program will positively affect the ICU nurses knowledge and attitude about EOLC for the COVID-19 elderly patients. The results of this study also highlight the importance of online education about EOLC for the COVID-19 elderly patients.

Recommendation

- Educational programs about death and caring for dying COVID 19 elderly patients should be added to undergraduate nursing curriculums.
- Nurses at the ICUs needs continuous education about EOLC.
- Critical care nurses need formal online education about the importance of EOLC for elderly COVID-19 patients.
- Head nurses at ICUs should support the online educational method as a way to

overcome the difficulty in establishing face to face education during the pandemic.

- COVID-19 elderly patients should receive health education about palliative EOLC.
- COVID-19 patient's family should be involved in the care and decisions making during the EOLC.
- Further research is recommended to examine nurse's knowledge and attitude about EOLC and its effect on their practice using a large sample.

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