

Evaluation of Educational Program toward COVID 19 Patients Oxygen Therapy on Nurses Knowledge in Al-Hillah City

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Abstract

Background Respiratory system plays a crucial role in sustaining important physical functions; thus, the control of the respiratory system is the first aspect in good intensive care unit patient care. Respiratory care consists of preserving the patency of the airways, oxygen treatment, respiratory monitoring, dental care, and care linked to preventing ventilator-associated infections. Objective: To evaluate the knowledge of critical care nurses toward educational program focus on oxygen therapy for coronavirus disease 19. Methodology: A quasi-experimental design selected as suitable method to evaluate of effectiveness educational program toward COVID 19 patient's oxygen therapy on nurse's knowledge during the period of 3ed January 2022 to 26th February-2022. The study conducted at the critical care units which distributed at Al-Hillah Teaching Hospitals. Non-probability (purposive) sample selected, the original sample were divided to two groups, the first one is control group consist of (30) nurses, while the remaining number (32) assigned as interventional group member. Proper questionnaire prepared for data collection. Results: Most of participants in both groups 15 (48.4%), 15 (50%) were between (24-26) years age group, 19 (61.3%), 15 (50%) were male, 16 (51.6%) were diploma degree holder in interventional group, while 20 (66.7%) were bachelor degree in the control group, significant improvement in nurse's knowledge regarding oxygen supplement after their attendance to the educational program session, while the results shows no significant change for control group is presented in the following two post-test Conclusion: Significant differences of interventional group between their pretest and two posttests recording for the nursing knowledge regarding oxygen therapy for coronavirus disease 19 patients, while no significant differences recorded among control group members.

Keywords: Evaluation, Educational Program, COVID 19, Oxygen Therapy, Knowledge

1. Introduction

Coronavirus disease-2019 (COVID-19), known as an extremely contagious viral pandemic impacting over one million individuals in over two hundred nations. In Jan. 2020, World Health Organization (WHO) reported to there is a public health emergency of international concern (PHEIC). It's caused by a new severe acute respiratory syndrome coronavirus 2 strain (SARS-cov-2) which was initially discovered in Dec.2019, respiratory droplets are the primary vector for human-to-human transmission (sneezing and coughing). It's also transferred by physical connection (such as handshakes) with an infected individual or a contaminated object and subsequent transmission to the eyes, nose, or mouth (Ahmed et al., 2020) (Siddiq et al., 2020). Most of persons who infected with the covid-19 will get moderate severe pulmonary complication as a result of their infection that is curable without specific treatment. People who are older or who have underlying conditions such as diabetes, cancer, chronic lung disease, or circulatory disease are at a greater risk for developing serious diseases (Matos et al., 2020). Mortality is related with advancing age, greater severity of illness scores, comorbidities (such as diabetes, lung disease, cancer, chronic hypertension,

and cardiovascular disease), greater C-reactive protein and d-dimer concentrations levels, worse respiratory failure, secondary infections, and lower lymphocyte counts (Phua et al., 2020).

Abnormal oxygenation in the lungs, that may be caused by direct pulmonary damage (e.g., significant trauma or pneumonia) or indirectly causes such as cardiac arrest, disrupted hemodynamics in sepsis, pulmonary embolism, or shock. Reduced breathing as a result of opiate analgesics or painful respiration may potentially lead to hypoxia. Because oxygen is the primary fuel for the metabolism of the cells and organs of humans and animals, a significant decrease in the tissue oxygen concentration would result in quick and severe damage to multiple organs, particularly the brain, which is the most susceptible organ to hypoxia. Hypoxia is prevalent in severe illness, and hypoxic brain injury is one of the most feared hypoxia-related consequences. Moreover, a large percentage of patients in intensive care units require ventilators, which typically involves the use of oxygen therapy above the level of oxygen in room air (21 percent). As a result, oxygen therapy is administered to the vast majority of patients in intensive care units (O'Driscoll & Smith, 2019).

Ventilator act as life-saving strategy used for critically sick person diagnostic with respiratory failure. Mechanical ventilation is a frequent therapeutic

procedure that looks necessary anytime a patient's respiratory capacities are impaired by a number of disorders; it is a life-sustaining therapy that should be discontinued as soon as the patient is able to maintain autonomous breathing. It's a rapidly advancing technology intensive science, and it can reduce the mortality and morbidity effectively to a great extent. A mechanical ventilator is a device that assists individuals in breathing when they are unable to do so on their own. Also known as a breathing device, respirator, or ventilator. The majority of patients who need ventilator support due to serious illness are treated at the respiratory care unit (RCU) (Chithra and Janula 2017). Skilled and informed nurses are essential for making right judgments in patient care and minimizing patient risks. Knowledge of evidence-based procedures should empower critical care nurses to make sound judgments and minimize undesirable consequences in the recovery of patients using mechanical breathing (Chithra and Janula, 2017).

Study objectives

- To evaluate the knowledge of critical care nurses toward oxygen therapy focus on coronavirus disease 19.

2. Methodology

A quasi-experimental design selected as suitable method to evaluate the effectiveness of educational program toward COVID 19 patient's oxygen therapy on nurse's knowledge in Al-Hillah city. The study conducted at the critical care units which distributed at Al-Hillah Teaching Hospitals (Al-Shefaa Center at Marjan Teaching Hospital, Imam Al-Sadiq Teaching Hospital and Al-Hillah Teaching Hospital). Non-probability (purposive) sample methods selected to collect the data which is consider the suitable methods for this type of design. The original sample

consist of (62) nurses out of (214) nurses were selected, the original sample were divided to two groups, the first one is control group consist of (30) nurses, while the remaining number (32) assigned as interventional group member. In order to evaluate the effectiveness of educational program toward COVID 19 patient's oxygen therapy on nurse's knowledge in Al-Hillah City comprehensive review of related literature was performed to proper questionnaire form as a tool to achieve the objectives of study. Two version of questionnaire prepared in Arabic and English language to make it easy to participants. The questionnaire divided as the following: Part One: Demographical Data sheet, it consists from (4) items Part Two: Employment information, it consists from (4) items. Part three: Critical Care Unit Nurses' Knowledge of Oxygen supplement for Patients with Coronavirus Disease 19, which consist from (13) questions. The questions are arranged according to revised bloom taxonomy priorities, which are (Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). Validity obtained by 12 experts, while reliability obtained by using statistical interclass correlation coefficient (0.874), which is statistically accepted, statistical analysis of the data performed by using statistical package of social sciences (SPSS version 22).

Ethical Consideration

Professional ethics for nurses will state the ideal path in which they should behave in all relationships including patients, patient's family, coworkers. The ethical rules followed by the researcher when carrying out nursing researches directed to secure individuals right and welfare. Formal agreement obtained for all nurses who participate in the study after a brief introduction of the study objectives and importance.

Data Collection

Demographic characteristics	Rating and intervals	Interventional group		Control group	
		F	%	F	%
Age / Years	Less than 24	10	32.3	8	26.7
	24-26	15	48.4	15	50.0
	More than 26	6	19.4	7	23.3
	Total	31	100.0	30	100.0
Gender	Male	19	61.3	15	50
	Female	12	38.7	15	50
	Total	31	100.0	30	100
Education Status	Diploma in Nursing	16	51.6	10	33.3
	Bachelor of Nursing	14	45.2	20	66.7
	Postgraduate	1	3.2	0	0
	Total	31	100.0	30	100.0
Marital Status	Single	18	58.1	10	33.3
	Married	13	41.9	20	66.7
	Divorced	0	0	0	0
	Separated	0	0	0	0
	Widow	0	0	0	0
	Total	31	100	30	100

Data were collected through self-report method during the period of 3rd January 2022 to 26th February-2022; the critical care nurses who participate in the study need approximately (25 - 30) minutes to complete all items of the questionnaire.

The participants inform that they are free to withdraw from the recruitment even they had given their consent previously to participate in the study. All the participants of the study group (62) are exposed to pre-test, to determine their knowledge about

pulmonary care of coronavirus disease 19. All the participants of the interventional group (32) are exposed to the educational program, which was implemented at Al-Hillah teaching Hospital \ critical care unit. The educational program was constructed

to provide the nurses with knowledge for provided oxygen therapy for coronavirus disease 19, which is presented for (45) minutes small group method used.

3. Results

Table 3: Assessment of the responses of study sample (interventional and control) and control group related to knowledge about oxygen supplement

N	Items	Interventional group			Control group		
		Pretest	Posttest 1	Posttest 2	Pretest	Posttest 1	Posttest 2
		M ± Std	M ± Std	M ± Std	M ± Std	M ± Std	M ± Std
1.	The goal of oxygen therapy is:	1.65 .486	1.90 .301	1.97 .180	1.93 .254	1.73 .450	1.66 .484
2.	The transfer of oxygen to tissues depends on several factors such as	1.58 .502	1.90 .301	1.81 .402	1.43 .504	1.50 .509	1.53 .507
3.It is a drop in the arterial oxygen content in the blood, and its symptoms include difficulty breathing, elevated blood pressure, and altered pulse rate, warm core, icy limbs	1.74 .445	1.87 .341	1.68 .475	1.60 .498	1.67 .479	1.43 .504
4.	The shortage of oxygenated blood is caused by consequences of oxygen deficiency in the cells.	1.29 .461	1.90 .301	1.58 .502	1.23 .430	1.23 .430	1.33 .479
5.	If the peripherals blood oxygenation (SPO2) is less than in people with COVID-19, we recommend commencing supplemental oxygen.	1.16 .374	1.77 .425	1.68 .475	1.30 .466	1.33 .479	1.43 .504
6.	When providing ventilation support to people suffering from acute respiratory failure, hypoxemia because of COVID 19it is suggested that oxygen concentration not exceed	1.48 .508	1.68 .475	1.68 .475	1.53 .507	1.40 .498	1.40 .498
7.	It is recommended that SPO2 be kept at..... as possible for pregnant women with COVID-19 and emergency symptoms (shock, convulsions, coma, severe respiratory distress, central cyanosis, or obstructed or absent breathing).	1.65 .486	2.00 0.000	1.84 .374	1.77 .430	1.77 .430	1.77 .430
8.	It is recommended that SPO2 be kept at or more than..... as possible for children with COVID-19 and emergency symptoms (shock, convulsions, coma, severe respiratory distress, central cyanosis, or obstructed or absent breathing).	1.06 .250	1.87 .341	1.58 .502	1.30 .466	1.43 .504	1.37 .490
9.	Which of the following forms of oxygen treatment must be utilized for persons diagnosed with COVID-19 who also have acute hypoxemic respiratory failure?	1.13 .341	1.48 .508	1.29 .461	1.27 .450	1.33 .479	1.40 .498
10.	Amount of oxygen gas flow supplement for adult by high flow nasal cannula systems can deliver about	1.29 .461	2.00 0.000	1.77 .425	1.20 .407	1.37 .490	1.17 .379
11.	Which of the following statements is not considered a means of assessing the patient's need for oxygen	1.13 .341	1.81 .402	1.58 .502	1.23 .430	1.23 .430	1.17 .379
12.	One of the complications of oxygen therapy is oxygen toxicity, which occurs as a result of giving a very high concentration of oxygen	1.10 .301	1.77 .425	1.61 .495	1.10 .305	1.13 .346	1.23 .430
13.	Which of the following oxygen delivery systems is not considered a low flow oxygen delivery system?	1.42 .502	1.74 .445	1.71 .461	1.60 .498	1.33 .479	1.23 .430
General mean and SD		1.36 .240	1.82 .139	1.67 0.163	1.42 0.247	1.42 0.196	1.39 0.180
Assessment		Poor	Good	Good	Poor	Poor	Poor
No.		31	31	31	30	30	30

M= mean of scores, Std= (stander deviation), cut off point= 0.5, mean of scores = 2, (poor knowledge= 1-1.49), (Good knowledge = 1.50-2)

4. Discussion

Table (1) which presented the results related to the demographical characteristic of the study sample shows that most of study sample (both groups) 15 (48.4%), 15 (50%) were (24-26) years old. This result supported by study carried out by (Ahmed et al 2020) titled as "knowledge, awareness and practice of health care professionals amid SARS-CoV-2, corona virus disease outbreak", the finding revealed

that most of the participants 300 (37%) out of n= 810 were (22-25) years old. Most of the nurses in the critical care units were young related to the responsibilities complex of the work and fast turn off. 19 (61.3%), while the control group were equal in numbers between male and female 15 (50%). The study published in, 2021 to study "Efficacy of COVID-19 prevention educational program on Nurses' knowledge and practices at hemodialysis unit" in Egypt by Elpasiony et al founded that most

of participants were male 16 (53.3%). The critical care unit receives complicated cases the work load is so heavy for this reason most of the nurses in this area were male.

Saddon and Hassan, 2017, applied an educational program in Al-Amara City at Al-Sader teaching hospital to enhancing the nursing care of patients with chronic obstructive pulmonary illness, in this study the researcher founded that most of the participant 17 (56.7%), 15 (50.0%) were with diploma in nursing, this results parallel with our finding which shows that the high percentage of the interventional group 16 (51.6%) were diploma holders, while high percentage of the control group 20 (66.7%) were bachler holders.

The marital status of nurses working in intensive care unit who participate in the study were 18 (58.1%) were single for interventional group, while for control group 20 (66.7%) were married.

Related to the years of experience table (2) shows that 14 (45%) were less than one year in the interventional group and 14 (46.7%) for control group were between (1-5) years of experience. This result agrees with study applied by Giao et al, 2020 which carried out to assess health care worker knowledge and attitude toward coronavirus disease 19, the results indicate that (70%) of the participant were nurses, (62.9%) were with less than 5 years' experience.

Related to years of experience in the intensive care unit the results shows that 23 (74.2%) were less than 1 year in the interventional group, while the control group recorded 15 (50 %) within 1-5 years of experience in critical care unit. This results not supported by study applied in kingdom of Saudi Arabia among critical care nurses titled as "effect of structured teaching program on knowledge regarding prevention of ventilator associated pneumonia" which founding that most of participants (39%) their experience in critical care unites between (5 – 10) years (Chithra and Janula 2017).

Also, table (2) shows that most of the participants in study sample 29 (93.5%) and 29 (96.7%) didn't received any educational courses related to pulmonary care for patients with respiratory complication in case of coronavirus disease 19. This result supported by study applied in turkey to assess nurses' knowledge about coronavirus disease 19 which founded that most of study sample 96 (51.4%) were not receiving an education about coronavirus disease 19.

This conclusion might be explained by the fact that nurses in the study settings did not get any in-service education or training. Inadequate nurse training may be the result of organizational reasons such as a lack of training resources and a nursing staff shortage, which prevents nurses from attending training programs outside of the hospital. On the other hand, most of the study sample (both groups) 24 (77.4%), 28 (93.3%) were depending on self-education related to interested study phenomena. The nurses

who work in the critical care unit needs to improve their knowledge to maintain the quality of care which provided of the patients and their families.

Mostafa et al, 2019 carried out an educational sessions to improve nurses knowledge and practices pulmonary diseases caring oxygen therapy in Egypt, found that high significant differences recorded in the mean score of nurse's knowledges before and after carrying out the educational sessions related to oxygen therapy, this result parallel with results appeared in table (3) which presents statistical analysis of nurse's who participate in the study shows changes of their knowledge level when comparing between the pre-test (1.36 ± 0.240), and long with two posttest (1.82 ± 0.139), (1.67 ± 0.163). this significant improvement in nurse's knowledge regarding oxygen supplement. Occurs after their involvement in the educational session which prove the effectiveness of the educational program session on the development the nurse's knowledge.

5. Conclusions

Significant differences of interventional group between their pretest and two posttests recording for the nursing knowledge regarding oxygen therapy for coronavirus disease 19 patients, while no significant differences recorded among control group members.

6. Recommendations

Continuous nursing education and in-service training programs of nurses should be organized within critical care units and equipped with the training facilities and resources needed to improve quality of nurses' knowledge, which will improve nursing care which offered to the patients' and positively on health services outcome.

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