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Critical Care Nurses' Performance Regarding Use of Neuromuscular Blocking Agents in Patients with Respiratory Failure

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Abstract:

Background: The respiratory system provides oxygen to and removes carbon dioxide from the body however the inability to perform either or both of these tasks results in respiratory failure. **Aim:** The present study aimed to assess the critical care nurses' performance regarding use of neuromuscular blocking agents in patients with respiratory failure. **Design:** A descriptive research design was used. **Setting:** The study was carried out in intensive care units at Aswan University Hospital. **Subjects:** A convenient sample of (100) nurses who provided care for patients with respiratory failure and administrated neuromuscular blocking agents at the previous mentioned setting. **Tools:** data were collected through using two tools. Tool I: Nurses' self- administered interview questionnaire consisted of two parts: part I, Nurses' demographic characteristics. part II, Nurses' knowledge assessment questionnaire. Tool II: Nurses' practice observational checklist. **Results:** The study finding indicated that less than three quarters of the studied nurses had unsatisfactory level of total knowledge about using of neuromuscular blocking agents in patients with respiratory failure. More than three quarter of the studied nurses had incompetent level of total practice. There was a significant statistical relationship between nurse's total level of knowledge and their educational level and attending training courses about neuromuscular blocking agents. **Conclusion:** There was a statistically significant positive correlation between nurses' total level of knowledge and their total level of practice. **Recommendation:** Replication of the study on other sample selected from different hospitals in Egypt to generalize the study findings.

Keywords: *Neuromuscular blocking agents, Respiratory Failure*

Introduction:

Neuromuscular blocking agents are not routinely used in the ICU, NMBAs are mainly used in well-documented precise scenarios. However, the current pandemic and the tsunami of acute respiratory distress syndrome (ARDS)cases have forced the massive use of mechanical ventilation and the use of neuromuscular relaxants for several days. This has generated among other things a concern about the doses used adverse effects and ability to adequately evaluate the effect of these drugs with a monitoring tool ***(Rodríguez-Blanco et al., 2022).***

Neuromuscular blocking -agents (NMBAs) help to reduce patient movement, breathing, or ventilator dysynchrony and allow lower insufflation pressures during laparoscopy. It has several indications for use in the intense care unit. It can help reduce hoarseness in voice as well as injury to the vocal cord during intubation. In addition, it plays an important role in facilitating mechanical ventilation in patients with poor lung function ***(Jahromi et al., 2020).*** In clinical use, neuromuscular block is used adjunctively to anesthesia to produce paralysis, causing relaxation of skeletal muscles. Because the appropriate dose of neuromuscular blocking drug may paralyze muscles required for breathing the diaphragm, mechanical ventilation must be available to maintain adequate respiration ***(Jahromi, et al., 2020)***.

The priorities in the care of patients with respiratory failure are identifying and treating the underlying cause, along with supportive therapies to prevent further lung injury. Most recent advances in the treatment of respiratory failure focus

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on the latter minimizing ventilator-associated lung injury through the application of low tidal volumes high levels of positive end- expiratory pressure, prone ventilation and neuromuscular blockade ***(Tao et al., 2019).***

Knowledgeable critical care nurse is essential to the effective and safe use of NMBAs in intensive care units. The institute for safe medication practices considers NMBAs to be high-alert medications because of the robust historical documentation of harm associated with their use. Indeed, prolonged use of neuromuscular blocking agents contributes to an increased risk for corneal ulcers, skin breakdown, venous thromboembolism, ventilator-associated pneumonia and musculoskeletal debility ***(Erin et al., 2020).***

Nursing care of patient under treatment with neuromuscular drugs as controlling and observing temperatures. Check temperature every 1 hour. If the oral temperature is below 36 degrees Fahrenheit or a cooling blanket is being used, the internal body temperature should be checked. Neuromuscular blocking agents analyze muscle activity and decrease heat production. NMBs may be used to control metabolic rate prevent shivering and facilitate hypothermia. Inappropriate usage may lead to hypothermia due to reduced heat generation and an inability to shiver ***(Pühringer et al., 2018).***

Significance of The Study:

The World Health Organization (WHO,2019) has reported that estimate incidence of respiratory failure in Egypt about 65% of incidence around world, about 516,023 confirmed cases, 24,830 confirmed deaths. The incidence of respiratory failure was found to be 1,275 cases per 100,000 adults. Acute respiratory failure related to Coronavirus (COVID-19): It is estimated early in the COVID-19 pandemic that up to 79% of hospitalized patients developed respiratory failure requiring invasive mechanical ventilation **(Cummings et al.,2020)**.

Neuromuscular blocking drugs are commonly used and have been shown in the literature to be associated with an incidence of residual blockade at the end of surgery and/or in the post anesthesia care unit (PACU) of up to 64% **(Saager et al., 2019)**. A variety of challenges impose on nurses throughout the provision of care for patients with respiratory failure in ICU **(Park, 2020).** So, this study aims to assess the critical care nurses' performance regarding use of neuromuscular blocking agents in patients with respiratory failure.

Aim of the Study:

This study aimed to assess the critical care nurses' performance regarding use of neuromuscular blocking agents in patients with respiratory failure: this aim will be achieved through the following objectives:

- Assess the level of knowledge of critical care nurses' performance regarding use of neuromuscular blocking agents in patients with respiratory failure.
- Assess the level of practices of critical care nurses' performance regarding use of neuromuscular blocking agents in patients with respiratory failure.
- Assess relation between total knowledge and total practice of critical care nurses regarding use of neuromuscular blocking agents in patients with respiratory failure

Research questions:

- What is the level of knowledge of critical care nurses regarding use of neuromuscular blocking agents in patients with respiratory failure?
- What is the level of practices of critical care nurses regarding use of neuromuscular blocking agents in patients with respiratory failure?
- Is there relation between total knowledge and total practice of critical care nurses regarding use of neuromuscular blocking agents in patients with respiratory failure?

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Subjects and Methods: -

Research design:

A descriptive exploratory research design was utilized to achieve the aim of this study. Descriptive research is designed to describe a group of individuals on a set of variables to document their characteristics. It provides a basis for further investigation ***(Portney, 2020).***

Setting

This study was conducted in intensive care units at Aswan University Hospital. The build likes shape I. which consists of 3floors. the data was collected from second floor which consist of three intensive care units (ICUs), each ICU consist of 12 beds and 28 nurses and the third floor in Cardiac care unit (CCU) which have 10beds and 26nurses.

Subjects:

A convenient sample of (100) nurses who provided care for patients with respiratory failure and administrated neuromuscular blocking agents at the previous mentioned setting.

Tool of data collection

Data was collected using two tools as the following: -

Tool I: Nurses self-administered interview questionnaire It was designed by the investigator after reviewing relevant literature **(Mayer, 2016 and Frazee, 2015).** which consist of two parts;

Part I: Demographic characteristics of nurses such as: age, gender, marital of status, level of education, years of experiences and previous attendance of training courses related to preventing respiratory failure and neuromuscular blocking agents.

part II: Nurses' Knowledge Assessment Questionnaire: which includes 32 closed-ended questions related to definition, signs and symptoms, causes, investigations, side effects, types, nursing role, complications, management treatment, which includes nurses' knowledge of neuromuscular block agents and nurses' knowledge of respiratory failure such as (What is the right about respiratory failure and All of this symptom of chronic respiratory failure except…. etc.

Scoring system

Knowledge obtained from the studied nurses graded as following: - zero was given for incorrect answer and one was given for correct answer. The total scores of knowledges were summed up and converted into a percentage score. It ranged from 0–32 degree which equal 100% and categorized as following: -

- Satisfactory knowledge if total score ≥ 80% (≥ 25Q)
- Unsatisfactory knowledge if total score from < 80% (<25Q)

Tool II: Nurses' observational checklist for practice: It is adapted from ***(Lohman, 2021,),*** and modified by the investigator. It is designed in the English language and It included 31 items under three main domains and consisted of nursing actions on administered neuromuscular blocking agents on respiratory failure patients, with two choices (Done, Not done)

Scoring system:

The total score of studied nurses' practices ranged from 0-24 degree which equal 100%. Each item observed to be done was scored two and the item that was not done or not applicable was scored one. These scores were summed and converted into a percentage score and categorized as follow:

- **Score ≥ 80%** was (19Q) "Competent practice".
- **Score < 80 %** was (19Q) "Incompetent practice".

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Tools Validity and Reliability:

Validity:

The content validity was done through a panel of five experts from Medical Surgical nursing Department, Faculty of Nursing, Helwan University (one professor and two assistant professors and two lecturers). Their opinions were regarding comprehensiveness, accuracy, clarity, relevance and appropriateness of the study tools. Minor modifications were done based on expert's judgment and the final form was developed.

Reliability:

Testing reliability of the proposed tools was done statistically by Cronbach's alpha test. The coefficient alpha for knowledge questionnaire =0.87 and observational checklist= 0.89.

Ethical Considerations:

Approval to conduct the study was obtained from the scientific research Ethical Committee in the Faculty of Nursing, Helwan University at 19 of October 2022 in committee number (31) before starting the study. The investigator explained and clarified the study aim and conducting way to the subjects before taking the consent of participation. The investigator assured maintaining anonymity and confidentiality of data of subjects included in the study. The participants were informed about their right to withdraw from the study at any time without giving any reason. Ethics, vales, culture and beliefs were respected.

Pilot study:

A pilot study was carried out on 10% (10 nurses) of the sample to test clarity, applicability of the data collection tools. The participants who included in the pilot study were excluded from the study sample because some modification was done after conducting the pilot study.

Field work:

- Approval to carry out this study was obtained from the faculty of nursing, Helwan University to the Medical and Nursing Directors of the previous mentioned departments at Aswan University Hospitals which affiliated to Aswan University.
- A written informed consent was obtained from each participant prior to data collection after explanation of the aim of the study.
- Data collection started and completed within six months from the beginning of December (2022) until the end of May (2023).
- Data collection was done at the previous mentioned setting two days per week (Saturday and Monday) by the investigator in the morning shift between 10.00 AM to 1.00 PM.
- Each nurse took about 30-40 minutes for interviewing and completing the questionnaires data as the following. The observational checklist was used prior to administration of the interview questionnaire to ensure the maximal realistic observations of the nurses' performance and minimize bias possibility.
- The study tools were checked in and completed as the following: started with nurses' observational checklist for practice to assess nurses' practice about administered faculty of nursing at Helwan University. Neuromuscular block agents then demographic characteristics questionnaire, was obtained then Nurses' Knowledge assessment questionnaire, was filled the study subject were assured that information collected would be confidentially and then it would be used only for the study.

Statistical Analysis:

- The collected data were organized, categorized, tabulated and statistically analyzed using the statistical package for social science (SPSS) version 25. Quantitative data were presented as mean and standard deviation (SD) while qualitative data were expressed as frequency and percentage. **Chi-square test (*X2*)** was used as a test of

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Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

significance to test relations between quantitative variables. The observed differences and associations were considered as follow

- P > 0.05 was considered not- significant **(NS).**
- P ≤ 0.05 was considered Significant**(S).**
- p≤ 0.001 was considered highly Significant **(HS)**

Result:

Table (1): shows that, 49.0% of the studied nurses were in age group 20 <30 years old with a mean age 31.04±7.56, 66.0% of studied nurses were females, 52.0% of them were graduated from technical nursing institute and 54.0% of studied nurses were married. Also, 43.0% of studied nurses had less than 5 years of experience with mean 6.78± 4.98. Regarding to courses, 85.0% and 56% of studied nurses hadn't attended courses on neuromuscular blocking agents and on preventive methods of respiratory failure respectively.

Figure (1): illustrates that 74.0% of the studied nurses had unsatisfactory level of knowledge while 26.0% of studied nurses had satisfactory level of knowledge regarding use of neuromuscular blocking agents in patients with respiratory failure.

Figure (2): illustrates that, 78.0% of the studied nurses had incompetent level of practice while only 22.0% of studied nurses had competent level of practice regarding use of neuromuscular blocking agents in patients with respiratory failure

Table (2) reveals that, there was a statistically significant relation between nurse's total level of knowledge and their educational level and attending training courses about neuromuscular blocking agents at P-value =0.05 respectively. While there was no significant statistical relationship between nurse's total level of practice and their gender, marital status, years of experience and attending training courses about preventive methods of respiratory failure at P-value =0.05 respectively

Table (3) reveals that, there was a statistically significant relation between nurse's total level of practice and their age, educational **level** and attending training courses about neuromuscular blocking agents at P-value =0.05 respectively.

Table (4) reveals that, there was a statistically significant positive correlation between nurse's total level of practice and their total level of knowledge at P-value =0.05

Table: (1) Frequency and percentage distribution of demographic characteristics of the studied nurses. (n=100)

Demographic characteristics	Items	N	%
Age (in years)	20 <30	**49**	49.0
	30 <40	32	32.0
	40 <60	19	19.0
	Mean ± SD	31.04±7.56	
Gender	Female	66	66.0
	Male	34	34.0
Educational qualification	Diploma of Nursing	22	22.0
	Technical Nursing Institute	52	52.0
	Bachelor of Nursing	26	26.0
Marital status	Single	42	42.0
	Married	54	54.0
	Divorced	2	2.0

ISSN 2786-0183
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Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

	Widow	2	2.0
Years of experience	<5	43	43.0
	5-<10	35	35.0
	≥10	22	22.0
	Mean ± SD	6.78± 4.98	
Attending courses on neuromuscular blocking agents	Yes	15	15.0
	No	85	85.0
Attending courses on preventive methods of respiratory failure	Yes	44	44.0
	No	56	56.0

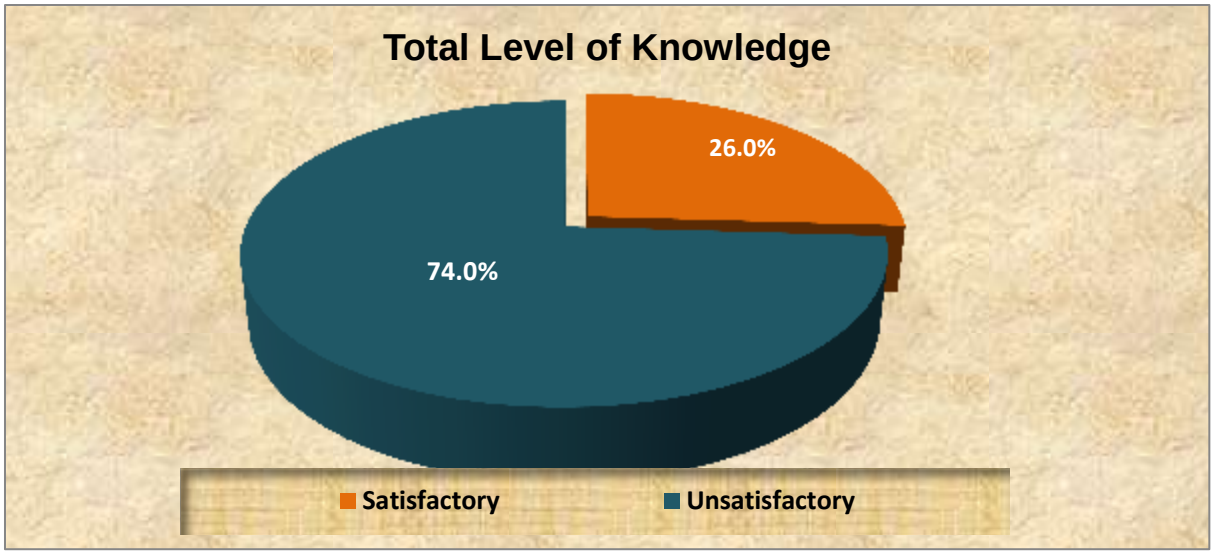

Figure (1): percentage Distribution of the studied nurses according to their total level of knowledge about using of neuromuscular blocking agents in patients with respiratory failure (N=100)

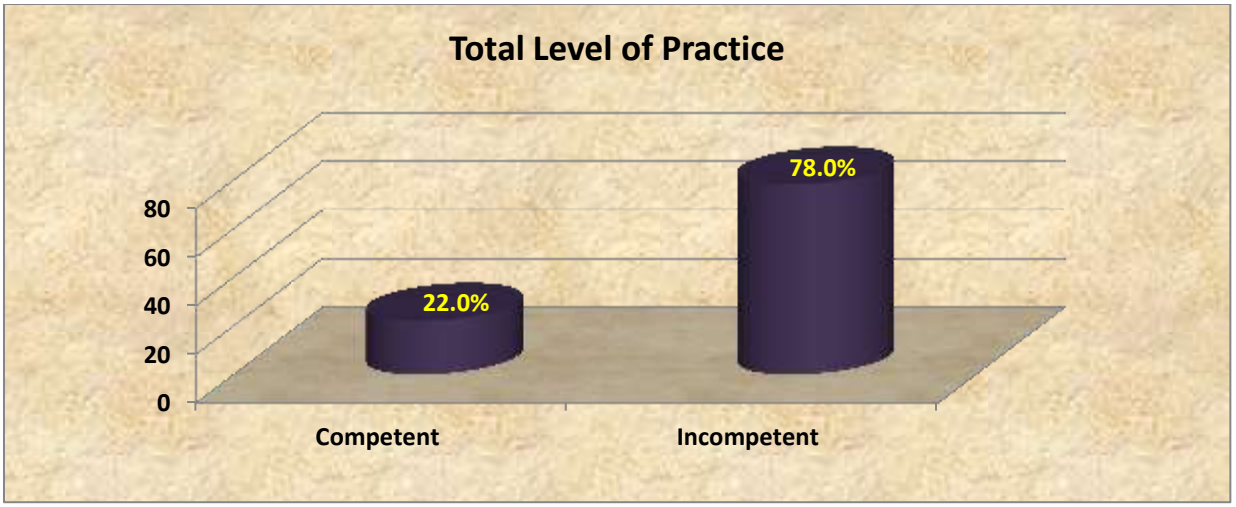

Figure (2): percentage Distribution of the studied nurses according to their total level of practice about use of neuromuscular blocking agents in patients with respiratory failure(N=100)

ISSN 2786-0183
Helwan International Journal for Nursing Research and Pratctice
Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

Table (2): Relationship between demographic characteristics of the studied nurses and their total level of knowledge (N=100).

Demographic characteristics		Total level of Knowledge				X^2	P-value
		Satisfactory		Un-satisfactory			
		N	%	N	%		
Age (in years)	20 <30	12	12.0	37	37.0	0.382	0.826 (NS)
	30 <40	8	8.0	24	24.0		
	40 <60	6	6.0	13	13.0		
Gender	Female	19	19.0	47	47.0	0.784	0.367 (NS)
	Male	7	7.0	27	27.0		
Educational qualification	Diploma	4	4.0	18	18.0	2.156 FET	0.041* (S)
	Nursing Technical Institute	6	6.0	46	46.0		
	Bachelor of Nursing	16	16.0	10	10.0		
Marital status	Married	12	12.0	42	42.0	0.871	0.351 (NS)
	Unmarried	14	14.0	32	32.0		
Years of experience	<5	13	13.0	30	30.0	1.074	0.585 (NS)
	5-<10	7	7.0	28	28.0		
	≥10	6	6.0	16	16.0		
Attending courses on neuromuscular blocking agents	Yes	24	24.0	61	61.0	0.330 FET	0.056* (S)
	No	2	2.0	13	13.0		
Attending courses on preventive methods of respiratory failure	Yes	11	11.0	33	33.0	0.041	0.840 (NS)
	No	15	15.0	41	41.0		

X^2= Chi Square Test FET=Fisher Exact Test was used

P-value > 0.05 Non-significant (NS) * P-value ≤ 0.05 Significant(S)

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Helwan International Journal for Nursing Research and Pratctice
Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

Table (3): Relation between demographic characteristics of the studied nurses and total level of practice (nurses=100)

Demographic characteristics		Total level of practice				X^2	P-value
		Competent		Incompetent			
		N	%	N	%		
Age (in years)	**20 <30**	17	17.0	32	32.0	9.031 FET	0.011* (S)
	30 <40	3	3.0	29	29.0		
	40 <60	2	2.0	17	17.0		
Gender	**Female**	15	15.0	51	51.0	0.106	0.807 (NS)
	Male	7	7.0	27	27.0		
Educational qualification	**Diploma**	2	2.0	20	20.0	2.888 FET	0.034* (S)
	Technical Nursing Institute	14	14.0	38	38.0		
	Bachelor of Nursing	6	6.0	20	20.0		
Marital status	**Married**	10	10.0	44	44.0	0.829	0.463 (NS)
	Unmarried	12	12.0	34	34.0		
Years of experience	**<5**	5	5.0	38	38.0	4.812	0.090 (NS)
	5-<10	10	10.0	25	25.0		
	≥10	7	7.0	15	15.0		
Attending courses on neuromuscular blocking agents	**Yes**	22	22.0	63	63.0	4.977 FET	0.028* (S)
	No	0	0.0	15	15.0		
Attending courses on methods of respiratory failure preventing	**Yes**	9	9.0	35	35.0	0.109	0.741 (NS)
	No	13	13.0	43	43.0		

X^2= Chi Square Test **FET**=Fisher Exact Test was used **P-value > 0.05** Non-significant **(NS)** *** P-value ≤ 0.05** Significant**(S)**

ISSN 2786-0183
Helwan International Journal for Nursing Research and Pratctice
Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

Table (4): Correlation between total level of knowledge and total level of practice among the studied nurses

Variables	Total level of knowledge	
	R	P-value
Total level of practice	**0.866**	**0.017***

* P-value ≤ 0.05 Significant

Discussion

Concerning age of the studied nurses, the present study revealed that less than half of the studied nurses were in age group 20 <30 years old with mean age 31.04±7.56.

From the investigator point of view, this may be due to the predominance of nurses between the ages of 20-30 in Egypt is the result of a combination of demographic, economic, social, and cultural factors. The attractiveness of nursing as a career, combined with educational opportunities and government support, has made it a popular choice among the younger population. and also, may be interpreted by unwillingness of the older nurses to work in ICU and CCU, in addition higher age category senior nurses perform administrative role.

This finding was consistent with **Ahmed et al., (2023)** in their study in intensive care units of main hospital Assiut University in Egypt, entitled "Clinical outcomes of implementing two management protocols for acute respiratory distress patients with COVID-19: A randomized controlled trial" and revealed that more than half of the studied sample were 20 <30 years old

On the other hand, this result was contrasted with ***Wu et al., (2022)*** who examined the study in China, about "Neuromuscular Blocking Agents and Monitoring in China: A Cross-Sectional Survey of Current Management" and signified that less than quarter of the studied nurse were in age group 26<30 years.

As regards to gender, the present study showed that two thirds of the studied nurses were females. From the investigator point of view, it may be related to nursing environments may not always be perceived as welcoming or accommodating for Male nurses may face challenges related to stereotypes and gender biases in the workplace, which can discourage them from pursuing nursing as a career.

This finding was consistent with ***Ahmed et al., (2023)*** who revealed that more than half of the studied sample were female.

On the other hand, this result was incongruent with *Elmaboud et al., (2023)* who revealed a study in Anaesthesia Care Unit at Tanta Emergency Hospital and El-Minshawy General Hospital, about "Efficacy of educational module for nurses about "Safe care of patients under treatment of neuromuscular blockade agents on nurses' performance and patient's clinical outcomes" indicated that about three fifths of the studied nurses were males.

In relation to educational level of the studied nurses, the present study revealed that more than half of the studied nurses were graduated from technical nursing institute.

This result was dissimilar to **Ebrahimi & Basirinezhad et al., (2024)** who conducted a study in Iran about" Using the Electronic Educational Package of the Stress Management Program for the Mental Health and Job Performance of Intensive Care Unit Nurses in the Face of Patients with COVID-19" demonstrated that the majority of the studied nurses had a bachelor degree.

Also, this result was incongruent with **(Erbay et al., 2024) who** revealed a study in Turkey about " Medical Device-Related Pressure Injury Care and Prevention Training Program (DevICeU): Effects on intensive care nurses' knowledge, prevention performance and point prevalence" that the majority of the studied nurses had a Bachelor's degree.

ISSN 2786-0183
Helwan International Journal for Nursing Research and Pratctice
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Regarding to total level of knowledge about using of neuromuscular blocking agents in patients with respiratory failure, the present finding, illustrated that, about three quarters of the studied nurses had unsatisfactory level of knowledge while about a quarter of them had satisfactory level of knowledge regarding use of neuromuscular blocking agents in patients with respiratory failure.

From the investigator point of view, this may be related neuromuscular blocking agents are specialized drugs used in critical care settings. They require an in-depth understanding of their pharmacology, appropriate usage, potential side effects, and monitoring requirements. This complexity can make it challenging for nurses to maintain an adequate level of knowledge without continuous education and training. Also, may be related High patient loads and time constraints can limit the opportunities for nurses to engage in additional training or self-study, impacting their ability to stay informed about specialized topics like neuromuscular blocking agents.

These findings were agreed with **Elmaboud et al., (2023)** who illustrated that about more than three quarters of the studied nurses had unsatisfactory level of knowledge.

These findings were agreed with ***Attia et al., (2023)*** who carried a study in America at Intensive care units about nurses' knowledge about use of neuromuscular blocking agents in patients with respiratory failure and illustrated that about more than three quarters of the studied nurses had unsatisfactory level of knowledge.

Concerning total level of practice about use of neuromuscular blocking agents in patients with respiratory failure, the present study illustrated that, more than three quarters of the studied nurses had incompetent level of practice while less than one quarter of them had competent level of practice regarding use of neuromuscular blocking agents in patients with respiratory failure.

These findings were agreed with **Elmaboud et al., (2023)** who illustrated that about more than three quarters of the studied nurses had unsatisfactory level of practice.

These findings were consistent with **Attia et al., (2023)** who carried a study in America at Intensive care units about nurses' knowledge about use of neuromuscular blocking agents in patients with respiratory failure and illustrated that that the most of the studied nurses had low practice level.

Regarding the relations between demographic characteristics of the studied nurses and their total level of knowledge, the present study reveals that, there was a statistically significant relationship between nurse's total level of knowledge and their educational level and attending training courses about neuromuscular blocking agents at P-value=0.041 and 0.056 respectively.

This findings result were contraindicated with ***Goyal and Gupta et al., (2023)*** who showed that there was a statistically significant relation between nurse's total level of knowledge and increasing experience as anaesthesiologists(p=0.003).

Concerning Relationship between demographic characteristics of the studied nurses and their total level of practice, the current study findings reported that there was a statistically significant relationship between nurse's total level of practice and their age, educational level and attending training courses about neuromuscular blocking agents.

From the investigator point of view, it may be related to nurses with higher educational levels, such as those with advanced degrees, often have a more robust theoretical foundation in pharmacology and clinical practice. This enhanced education can contribute to better practical skills and a higher level of practice in administering medications, including neuromuscular blocking agents.

This findings result were in disagreement with ***Goyal and Gupta et al., (2023)*** who revealed that there was statistically significant relation between nurse's total level of practice and years of experience at P=0.014.

As regards to correlation between total level of knowledge and total level of practice among the studied nurses, the current study demonstrated that there was a statistically significant positive correlation between nurse's total level of practice and their total level of knowledge at P-value=0.017.

From the investigator point of view, it may be related to nurses with a strong educational background in pharmacology and medication management are more likely to have a deeper understanding of the mechanisms of action,

ISSN 2786-0183
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Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

indications, contraindications, and potential side effects of neuromuscular blocking agents. This knowledge equips them to make informed and safe decisions in clinical practice.

This result was fairly consistent with ***Nemes and Renew et al., (2020)*** who carried out a study in USA, about "Clinical practice guideline for the management of neuromuscular blockade: What are the recommendations in the USA and other countries" who revealed that there was a statistically significant positive correlation between nurse's total level of practice and their total level of knowledge.

Conclusion

The results of the current study answer research questions and achievement of the aim and illustrate that , about three quarters of the studied nurses had unsatisfactory level of knowledge and more than three quarters of them had incompetent level of practice regarding use of neuromuscular blocking agents in patients with respiratory failure, with a statistically significant positive correlation between nurse's total level of knowledge and total level of practice.

Recommendations

On the light of the current study findings the following recommendations are suggested:

At educational level:

- Neuromuscular blocking agents' procedure book should be available in intensive care units as a reference for all nurses.

At practice level:

- Providing training program to improve nurses' knowledge and practice regarding use of neuromuscular blocking agents in patients with respiratory failure.

At furthers researches:

- Replication of the study on other sample selected from different hospitals in Egypt to generalize the study findings.

References

1. **Ahmed, A. T., Tolba, A. A., Mohamed, A., Mohamed, Z. A., & Mohgoub, A. A. (2023**). Clinical Outcomes of Implementing Two Management Protocols for Acute Respiratory Distress Patients with COVID-19: A Randomized Controlled Trial. Available at SSRN 4409694.
2. **Attia, E.N., Hansen, H.A., Bauer, S.R., Dzierba, A.L., Stollings, J.L., Ryder, L.P., and Daniels, C.E. (2023).** Intensive care nurses' knowledge about use of neuromuscular blocking agents in patients with respiratory failure. American Journal of Critical Care, 24(5), 431-439.
3. **Cummings, M., Baldwin, M., Abrams, D., Jacobson, S., Meyer, B., Balough, E., Aaron, J., Claassen, J., Rabbani, L., Hastie, J., Hochman, B., Salazar-Schicchi, J., Yip, N., Brodie, D.,& O'Donnell, M. (2020) .** Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study. Lancet J. Jun 06; 395:1763-1770.
4. **Ebrahimi, H., Shariati, E., & Basirinezhad, M. H. (2024).** Using the electronic educational package of the stress management program for the mental health and job performance of intensive care unit nurses in the face of patients with covid-19. *International Journal of Health Studies*, *10*(1), 38-48.
5. **Eddy, R., Serajeddini, H., Knipping, D., Landman, S., Bosma, K., Mackenzie, C., Dhaliwal, I., & Parraga, G. (2020).** Pulmonary Functional MRI and CT in a Survivor of Bronchiolitis and Respiratory Failure Caused by e-Cigarette Use. *Chest Journal*. Oct;158(4):e147-e151.
6. **Elmaboud, S., Attia, N., El Deen, H., & Younis, G. (2023).** Efficacy of educational module for nurses about "Safe care of patients under treatment of neuromuscular blockade agents" on nurses' performance and patient's clinical outcomes. *Tanta Scientific Nursing Journal*, *29*(2), 154-168. https://doi.org/10.21608/tsnj.2023.298506.

7. **El-Raghi Mostafa, A & Rabea, A. (2023).** Acquired muscle weakness among Critical Ill Patients: Leading Agents Prevention. *Menoufia Nursing Journal*, *8*(2), 79-91.

8. **El-Raghi, M. (2023).** Acquired muscle weakness among critical ill patients: Leading agents and prevention. *Menoufia Nursing Journal*, *8*(2), 79-91. **https://doi.org/10.21608/menj.2023.308904.**

9. **Erbay Dallı, Ö., & Kelebek Girgin, N. (2024).** Medical device-related pressure injury care and prevention training program (DevICeU): Effects on intensive care nurses' knowledge, prevention performance and point prevalence. *Intensive and Critical Care Nursing*, *82*, 103622. https://doi.org/10.1016 /j.iccn.2024.103622.

10. **Erin, F., Heather, P., & Seth, B. (2020) .**Intensive Care Nurses' Knowledge About Use of Neuromuscular Blocking Agents in Patients with Respiratory Failure *Article in American Journal of Critical Care*; 24(5): 341-352.

11. **Erin, F., Heather, P., and Seth, B. (2020) .**Intensive Care Nurses' Knowledge About Use of Neuromuscular Blocking Agents in Patients with Respiratory Failure *Article in American Journal of Critical Care*; 24(5): 341-352.

12. **Frazee, E.N., Personett, H.A., Bauer, S.R., Dzierba, A.L., Stollings, J.L., Ryder, L.P., and Daniels, C.E. (2015).** Intensive care nurses' knowledge about use of neuromuscular blocking agents in patients with respiratory failure. American Journal of Critical Care, 24(5), 431-439

13. **Goyal, S., & Gupta, B. (2023).** A cross-sectional survey on knowledge, attitude, and practices of neuromuscular monitoring among Indian anaesthesiologists. Archives of Anesthesia and Critical Care. https:// doi .org /10.18502/aacc.v9i1.11939.

14. **Jahromi, S., Behdad, A., Knezevic, H., Nebojsa, A., & Nick, M. (2020).** Neuromuscular Block Monitoring in Patients with Facial Rejuvenation: A Case Report. A&A Practice, 14,2; PP;13-34. Doi:10 .1213/XAA. 0000000 000 001334.

15. **Lohman, J. M. (2021).** Efficacy of a Multimedia Educational Module on Best Practices of Anesthesia Patient Safety for Neuromuscular Blockade. Unpublished doctoral dissertation]. Cedar Crest College.

16. **Mayer, K.L., (2016).** DNP Project: Reversal of Neuromuscular Blockade with Neostigmine: Development of an Evidencebased Practice Protocol. Retrieved from: https://via.library.depaul.edu/csh_etd/150.

17. **Nemes, R., & Renew, J. R. (2020).** Clinical practice guideline for the management of neuromuscular blockade: What are the recommendations in the USA and other countries? Current Anesthesiology Reports, 10(2), 90-98. https://doi.org/10.1007/s40140-020-00389-3.

18. **Park, J. (2020).** Nursing Considerations When Using Neuromuscular Blocking Agents to Assist with Intubation: A Review of Literature. Critical Care Nursing Quarterly, 42(1), 30-40.

19. **Portney, H. (2020).** Neuromuscular Blocking Agents and Monitoring in China: A Cross-Sectional Survey of Current Management. Frontiers in medicine, 9, (7)701-705. https://doi.org/10.3389/fmed.2022.7701 05

20. **Puhringer, L., Forel, J., Gacouin, A., Penot-Ragon, C., Perrin, G., Loundou, A., Jaber, S., Arnal, J., Perez, D., Seghboyan, J., Constantin, J., Courant, P., Lefrant, J., Guerin, C., Prat, G., Morange, S., & Roch, A. (2018).** Neuromuscular blockers in early acute respiratory distress syndrome. N Engl J Med (3)63:1107–1116.

21. **Rodríguez- Blanco, J., Rodríguez-Yanez, T., Rodríguez-Blanco, J ., Almanza-Hurtado, A ., Martínez-Ávila, M., Borré-Naranjo, D., Caballero, M., and Dueñas-Castell, C. (2022).** Neuromuscular blocking agents in the intensive care unit. J Int Med Res. 3; 50: PP: 300-605. Published online 2022 Sep 29. Doi: 10.1177/03000605221128148.

22. **Saager, L., Maiese, E., Bash L. (2019).** Incidence, risk factors, and consequences of residual neuromuscular block in the United States: the prospective, observational, multicenter From "NMB Practice Guidelines," Preceding Page RECITE-US study. J Clin Anesth. (21); 55:33–41. PMID: 30594097.

23. Soliman, O., Moeen, S., Abbas, Y., & Kamel, E. (2022). The impact of dexamethasone versus methylprednisolone upon neutrophil/lymphocyte ratio in COVID-19 patients admitted to ICU and its implication upon mortality. *Egyptian Journal of Anaesthesia*, *38*(1), 78-84. **https://doi. org/10. 1080 /11101849.2021.2024985.**

24. **Steen, C., Freeman, S., and Bleakley, G. (2021).** Critical Care Related to the Respiratory System. Essentials of Nursing Critically Ill Adults, 75.

25. **TABANGCORA, I.D., (2022).** Neuromuscular Junction BlockingAgents,NurseslabsRetrievedfrom:https://nurseslabs.com/neuromuscularjunction-blocking agents/#nursing assessment.

ISSN 2786-0183
Helwan International Journal for Nursing Research and Pratctice
Vol. 3, Issue 7, Month: September 2024, Available at: https://hijnrp.journals.ekb.eg/

26. **Tao, W., Yang, L.Q., Gao, J., and Shao, J. (2019).** Neuromuscular blocking agents for adult patients with acute respiratory distress syndrome: a meta-analysis of randomized controlled trials. Journal of Trauma and Acute Care Surgery, 85(6), 1102-1109.

27. **Wu, H., Lin, Z., Zhou, R., Huang, S., Chen, L., Su, Y., Cheng, L., & Zhang, H. (2022).** Neuromuscular Blocking Agents and Monitoring in China: A Cross-Sectional Survey of Current Management. Frontiers in medicine, 9, 770105. https://doi.org/10.3389/fmed.2022.770105