

Application of Multicomponent Nursing Intervention to Controlling Delirium and Duration of ICU Stay among Critically Ill Older Adult Patient

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Abstract

Background Few studies have investigated delirium in a respiratory intensive care unit (RICU) population, thus knowledge is limited regarding it. **Aim**, the present study aimed to investigate the effectiveness of application of multicomponent nursing intervention to controlling delirium among critically ill older adult patients. **Quasi-experimental research design** was carried out to meet the aim of this study. **A purposive sample** included 60 old age critically ill patients taken from respiratory intensive care in Aswan University Hospital. **Tool 1, Patient assessment sheet** was used for collecting data, which included two parts: bio-demographic data and medical data, **Tool2**, intensive care delirium screening checklist to detection and monitoring delirium include eight screening area Each feature that manifests are given one point and zero point if not manifests Ascore ≥ 4 indicated delirium. **Tool3**, Richmond Agitation Sedation Scale (RASS) to predicted type of delirium. **Tool4** Multiple nursing intervention for controlling delirium. **Results:** Delirium was frequent in patients in the standard care group compared with our intervention group ($p = 0.04$), however no substantial differences between both groups regarding types, duration or delirium severity ($P \geq 0.05$), respectively. Moreover, the duration of ICU stay was lowered in our intervention group ($P = 0.001$). Age was a substantial risk element for delirium development by multiple regression analysis. **Conclusion:** the delirium episodes during RICU stay were established to all critically older adults with respiratory illnesses, as anticipated, after application of a multicomponent nursing intervention, the incidence of these adverse consequences was reduced. **Recommendation:** replication of these study on the large sample size in other ICU that provide care for critically ill older adult patients to decrease incidence of delirium within critical care setting.

Key words: Delirium, Nursing intervention, Critically elderly ill patient, and Respiratory intensive care unit.

Introduction:

Delirium in the elderly patients is accompanied by poor outcomes especially a critical care setting, including increase lengths of stays, increased mortality, higher costs, overuse sedation therapy, and physical restraints, increased accidental removal of tubes and catheters, and

beginning cognitive impairment (Pavone et al.,2019).

Despite its prevalence in all health care environments, delirium is especially raved in an intensive care unit (ICU) ranging from 45% to 84% and can lead to a number of negative outcome including the longest intensive care unit stay, accidental falls, increased mortality and functional

independence and Costs also greatly increase due to delirium (Mitchell et al.,2017).

Delirium characterized by a severe cognitive alteration (which progresses within hours or days) manifested in the instability of awareness and disorders in attention, memory, thought, perception and behavior (Macias Tejada et al.,2017).A current study exploring the frequency, occurrence, and consequence of delirium in the critical care setting (ICU), presented that a significantly higher percentage of older adult clients developed delirium rather than younger patients (Jayaswal et al.,2019).

Delirium may be a severe state that affects acutely ill older adult patients within the critical care setting. The American Association of Critical-Care Nurses (AACN) defines delirium as an alteration in awareness, inattention and either an alteration in perceptual or thought disturbances (Cahill et al.,2017).

It is also recognized by changes in sleep and wake cycles and exacerbates symptoms at night, interspersed with periods of clarity It can be dropped in the form of hyperactivity (agitation), hypoactive form (apathy, lethargy) or mixed, yet the most common type of delirium is hypoactive type (Bento et al.,2018).

Elderly critically ill patients have an increased risk of delirium, especially during ICU stay. This often results from infection, dehydration, microvascular coagulation, disrupt sleep pattern, moreover, adverse effect of medication particular sedation commonly used within ICU, older adult patients with critical illnesses who become delirious within six months are more likely to die than those who do not, with each additional day of

delirium (Ghaeli et al.,2018).It is important to treat the underlying cause of delirium, manage the confusion, and minimize the occurrence of further complications by providing safety and ensuring the patient remains hydrated, nourished, and as active and mobile as possible (Schaefer et al.,2019).

In the context of delirium development in ICU, nurse and health team additionally, family members as a caregivers could arguably play an important role in controlling and reducing the development of the syndrome (Ghaeli et al., 2018).

Delirium risk increases with the number of risk factors Therefore, multiple application of nursing strategies to decrease the number of risk factors for delirium to prevent delirium in older patients within ICU significant and potentially effective intervention for delirium, Therapeutic approaches of cognitive impairment included appropriate lighting, reorientation, early mobilization, Sleeping pattern promotion, sensory stimulation and family engagement in nursing care will be more effective and useful to patients and families (Kluger et al.,2018).

Significance of the study:

Delirium has an important issue due to the client's age above 65 years was reported for higher than 48 % of days of hospital care services (Marcantonio et al.,2017).

Every one year, a complication of delirium include the length of hospital stay for more than 2.3 million older people, involves more than 17.5 million inpatient days, and accounts for more than \$4 billion dollars of Medicare expenditures (Pastula et al.,2017).

The progress of delirium may give increase to other adverse outcomes in a critically older adult patient, such as cognitive and functional deterioration with loss of independence, falls, extended ICU stay, increased risk of death and rehospitalization, Because of their long-term interaction with patients and providing specialized care to them, nurses and health care provider can play a dynamic role in the control, early recognition, prevention, and evidence nursing care of patients with delirium (Gorski et al.,2017).

Hence this study was carried out to test the effectiveness of the application of multicomponent nursing intervention to controlling delirium among critically ill older adult patients with respiratory disease.

Aims of the study:

The present study aimed to investigate the effectiveness of the application of multicomponent nursing intervention to controlling delirium among critically ill older adult patients.

Research hypothesis:

H (1). There are many nursing intervention controlling or decreased delirium rate among critically ill elderly patients admitted to ICU.

H (2). The multicomponent of nursing intervention is more effective on the decrease length of stay among older adult intensive care patients.

Subjects and methods:

Research design:

Quasi-experimental research design was carried out to meet the aim of this study.

Setting:

This study was conducted at Respiratory intensive care unit in Aswan University Hospital from the beginning of October 2017 until the end of March 2018.

Sampling:

A purposive sample included 60 older adult critically patients taken from intensive care unit for six months.

The total sample was selected and distributed randomly and equally into two groups by using simple random number table (the first patient was selected for implementing multicomponent nursing intervention (study group) and the second patient was selected for control group which taken only the routine care of intensive care and so on).

Control group: consisted of 30 elderly patient was selected to perform the usual care.

Study group: consisted of 30 elderly patient was selected for applying multicomponent nursing intervention.

Inclusion criteria:

- Aged from 60 years and above, both sexes.
- All older adult critically patients who are oriented
- Delirium score is negative when admission to ICU
- Older adult who are accepted to participate in this study.

Exclusion criteria:

- Older adult connected to mechanical ventilation
- Older adult alcoholic and addicted to drugs;

- Patients using psychotropic drugs; not suffering from mental disorders such as psychosis, depression
- Older adult who refused to participate

Tool for data collection:

Four tools were utilized to collect the data of this study. They are developed by the researchers after extensive and relevant review of literature. The validity & reliability of these tools were revised by a panel of medical of respiratory disease staff, critical care nursing and geriatric nursing experts, and then pilot study was done.

First Tool: Patient assessment sheet (English form) was used to collect the data of this study (developed by the researchers), which included two parts as follows:

Part 1: Bio-demographic data of older critically ill patients as gender, age, weigh, height, hospitalization reason.

Part 2: An assessment sheet to collect medical data, past history, laboratory investigation, APACHE II score & SOFA score, delirium index and duration of ICU stay and risk factors that are contribute to delirium in older adult critically patients who are admitted to respiratory intensive care unit.

Second Tool: Intensive Care Delirium Screening Checklist (ICDSC): Bergeron, et al., 2001)

To detection and monitoring delirium in older critically ill patients.

The Scoring system tool II:

The checklist screening scale composed from eight areas was assessed

by researchers when patient admission to ICU and then performed every 12 hours to identify patients with delirium, the screening checklist include eight screening area: level of consciousness, inattention, inappropriate speech or mood, disorientation psychomotor agitation or retardation, hallucinations/delusions/psychosis, symptom fluctuation, and sleep/wake cycle disturbances Each feature that manifests are given one point, with zero points if not manifests within the specified time frame, a score ≥ 4 indicated delirium.

Third Tool: Richmond Agitation Sedation Scale (RASS): (Pop, et al.,2018).

This scale used to monitoring the sedation or agitation level. Performed by researchers.

The Scoring system tool III:

The RASS can describe their level of alertness or agitation. Patient alert and quiet (score 0), patient behavior that's restlessness (score +1) agitation (score +2), the patient is extremely agitated as pulls or removes tubes and catheter (score +3), a combative patient can violent and danger to staff (score + 4). The Patient has eye-opening and eye contact, which is sustained for quite 10 seconds (score -1). The client has eye-opening, but this is often not sustained for 10 seconds (score - 2), Patient has any movement in reaction to the speech, exclusive of eye contact (score -3), If a patient doesn't answer to speech but can physically be stimulated by shaking shoulder at that time rubbing sternum (score -4), the client has no response to speech or physical stimulation (score -5).

Fourth Tool: multicomponent nursing intervention for control delirium in ICU:

It developed by researchers based on national and international literature reviews. It was implemented by researchers at different times every shift to control and prevent the development of delirium in ICU. It consisted of the following:

The multiple nursing intervention comprised 6 items: improve oxygenation, daily reorientation, sensory stimulation, improve communication, physiotherapy and early mobilization, and enhancing sleep.

✓ First nursing intervention is a maintain oxygenation to prevent delirium or altered level of consciousness.

✓ Second nursing intervention, daily reorientation performed by researcher ,nurses and trained family member during visiting time within ICU reorient older adult including time, date, location within the hospital ,daily information about his or her plan of care including, Names of doctors, nurse and nursing assistant for the shift, Making sure a clock with the correct times is visible,

✓ Third nursing intervention, Sensory stimulation include:

- Eyeglasses, hearing aids, and dentures are available at all times.

- Enhancing hearing and vision by creating a quiet, private environment reduce background noise by pulling the curtain in the room and closing the door.

- If a person wears hearing and vision aid(s), make sure they are being used, and are clean and operating.

- Adjust if needed, and bringing in objects from homes such as religious objects, family photos, favorite clothing, or blanket.

✓ Fourth nursing intervention, improve communication: through using the “Clear Speech Method” by expressing every word, precisely and accurately in a fully formed manner, reinforce your speech with gestures, pointing, and touch.

✓ Fifth nursing intervention physiotherapy early mobilization program is to keep older patients physically moving while they are in the ICU. For patients that are able, assistance during walking. For those who are incapable to walk, passive and active range of motion must be performed. Walking at least 2-3 times per day is essential for physical and mental wellbeing,

✓ finally enhancing and normalize sleep by following many steps Encourage wakefulness during the day, maintain the patient’s usual sleep/rest patterns, uninterrupted sleep at night, Provide mouth care, Offer back, hand, or foot massage, a warm blanket, Provide low lighting and Minimize noise within ICU.

Outcome measures

1.Incidence, duration and severity of delirium among the whole study population: Severity of delirium was measured using the Delirium Index (DI), (**McCusker et al.,2004**) which included seven symptom domains of the CAM (disorders of attention, thought, consciousness, orientation, memory, perception, and psychomotor activity), each scored on a scale from 0 (absent) to 3 (present and severe). The total DI score

ranges from 0 to 21, with a higher score indicating greater severity.

2.Length of ICU stays between both groups.

Ethical considerations

- Administrative approval was obtained from the responsible persons (directors of Aswan University Hospital and the head of the intensive care unit).

- Written approvals were taken from the patients and next of kin after presenting ourselves to them and explaining the purpose of the study.

This study was carried out through three consecutive phases:

Preparatory phase, implementation phase and evaluation phase.

Methods for data collection:

Preparatory phase:

- This phase started by local, international, current, and past related literature in various aspects of the delirium problem among older critically ill patients.

Content validity

The validity of the tool was tested by measuring its contents validity index by 5 experts in medical respiratory disease, critical care nursing, and geriatric nursing field and it equaled 91% .

Reliability: The reliability of the tool was calculated statistically by alpha cronbach test ($r=0.82$).

Field working phase:

- The researchers collected the data during a period of six months from the

beginning of October 2017 until the end of March 2018. This was done during the routine work of the hospital at every shift. The assessment sheet requires about 15-20 minutes filling; about 1-2 critically elderly patients were collected per week.

- At the intensive care unit, the researchers introduced themselves and informed the nurses about the nature of the study.

- In 6 months duration, we enrolled 60 patients, divided into 30 patients (control group) for usual care and 30 patients (study group) for multiple nursing intervention.

- .During this phase, the researchers explained the aim of the study, components, preventive measures, technique and the importance of implementing multicomponent nursing intervention briefly to an older adult patient in the ICU and the informal caregiver to the delirious older adult patient. The time needed for completing the questionnaire was ranged from 30 to 45 minutes for each patient.

- After obtaining the patients consent for voluntary participation in the study.

- The patient's bio-demographic data were collected from the patient record.

- The assessment was done for all patients at admission to detect and monitoring delirium by using tool two.

- Multiple nursing intervention was performed for all study grouped enrolled in the study.

- Patient's families had been participated to ensure patients support and to facilitate achieve goals.

- The researchers explain and implement multiple nursing interventions in three or more sessions according to patient's condition. Each session ranged 25 to 35 minutes and including 5 minutes for discussion and feedback. each session content was as follow:

First session: this session implemented daily during morning shift it initiated by the researchers introduced themselves to the patients telling them; the purpose of the meeting, orient patients regarding nursing management. Contents of this session included; brief introduction about delirium and methods to prevent in ICU. This session finished with a summary of its content and feedback from the patient.

Second session: This session was implemented during afternoon shift three items from nursing intervention was applied by researchers it includes (improve oxygenation, daily reorientation, and sensory stimulation), Most patients were cooperative and interested in a given topic and asked to continue the nursing management.

Third session: This session was implemented during the night shift the remain three items from nursing intervention was applied by researchers it includes (improve communication, physiotherapy, and early mobilization, and enhancing sleep) researchers was used communication skills during all session to improve patients communication, physiotherapy, and early mobilization applied according to patient condition the researchers was demonstrated exercises. A complete explanation of these exercises, the greatest patients were cooperative and

interested in a given topic and asked to continue the nursing management.

Evaluation phase:

This phase was emphasized on evaluation rate of delirium in ICU for all studied patients through tool II, and evaluation length of stay in ICU at discharge or transferred to ward.

Statistical analysis:

Date entry and data analysis were done using SPSS version 19 (Statistical Package for Social Science). Data was presented as mean and standard deviation. Chi-square and Fisher Exact tests were used to compare qualitative variables. Mann-Whitney test was used to compare quantitative variables in case of non-parametric data. P-value was considered statistically significant at $P < 0.05$.

Results:

Table (1): Our study involved 60 subjects (study group 30 subjects & control group 30 Subjects), 70% of the control group were males in while 63.3% of our study group were males, no substantial variance between both groups regarding age, marital status and the level of education as shown in table (1).

Table (2): Regarding the clinical characteristics of all the study population, A major significant variation between both groups as regard the length of ICU stay ($P \leq 0.01$) while , no significant difference as regard the other parameters as shown in table (2).

Table (3): Clarified that there was a highly substantially variation between both the study and control groups

regarding Richmond Agitation Sedation Scale with ($P \leq 0.01$).

Table (4): illustrated that the incidence of delirium in our study group was lowered than the control group with a substantial variation ($P = 0.04$).

Table (5): There was a substantially significant variance between both groups regarding the cumulative incidence of delirium from second day morning to the sixth day morning ($P \leq 0.01$) as shown in table (5).

Table (6): Regarding the distribution of delirium characteristics including types, duration and severity of delirium (measured by the delirium index), no substantial variance between the two groups as shown in table (6).

Table (7): The multivariate regression analysis used for the analysis of predisposing risk factors for the development of delirium was shown in table (), demonstrated that for each 1-point increase in age of our patients, there were 1.7 times (odds ratio [OR], 95% confidence interval [CI], 0.13-5.8) increased odds of delirium while, controlling for other risk factors of delirium including malnutrition, dehydration, immobility, electrolytes disturbances, infection, hypoxia, sensory & functional impairments.

Fig.1: Clarified the most important risk factors leading to delirium between both groups. Infection & dehydration represent the important risk factors among the study group. Meanwhile, in the control group malnutrition, electrolytes imbalance, sensory impairment, and dehydration signify the important risk factors of delirium. Furthermore, in both groups, orthopedic surgery, functional

impairment and hypoxia are the most important risk factors of delirium.

Discussion

Delirium is a common state in older adults which can have deleterious consequences. Is accompanied by, increased level of mortality, morbidity, and length of hospital stay as well as increased use of healthcare services and costs (**Gual et al.,2018**).

Delirium is a serious geriatric syndrome in the ICU, particularly in those who have hospitalized ICU and/or severely compromised medico-surgical subjects (**Sieber et al.,2019**).

Current review was aimed to investigate the effectiveness of the application of multiple nursing interventions in controlling delirium among critically ill older adult patients with respiratory problems. This study concluded that delirium episodes during hospitalization in RICU were established to be common in all older adults with respiratory illnesses, as anticipated, but with the use of multicomponent nursing intervention, the incidence of these adverse consequences reduced. In participants who developed delirium, a nursing program had no effect on the severity or duration of the delirium incident.

The application of the multi-component nursing intervention comprises several interventions that are simple to carry out by health care providers. Most studies have delivered recommendation that a multi-component nursing intervention to prevent delirium was best effective when centered on synergistic collaboration between the several healthcare disciplines (**Morandi et al., 2019**) In the study by **Cheraghi et al.,**

2017. Presented that after application multifactorial intervention based on adjusted NICE strategies for hospitalized patients with open heart surgery the rate of delirium has been significantly decreased. In this regard, the study of **Martinez, et al., 2012**. Showed that the effectiveness of the non-pharmacological interventions and integrated actions reduce delirium rate more than traditional care.

With regard to episode of delirium occurred, the current study showed that the intervention did not shorten its duration. This result correlates with a study done by **Deschodt et al., 2012**, who shown that their inpatient geriatric consultation teams (IGCT) intervention diminishes the occurrence of postoperative delirium in patients with hip fracture, along with no effect on the duration or severity of delirium. Taken together, these results indicate that the most significant strategy to report delirium is its prevention. In accordance with their findings, findings, the current study showed that, the incidence of delirium was lower in our intervention group.

The study by **Zolfaghari, et al., 2012**, showed that multifactorial application on nursing practice, nursing teaching about the environmental diagnosis of delirium, and simple interventions can decrease the incidence of delirium in open-heart surgery hospitalized patients. Lastly, a recent meta-analysis explore that non-pharmacological, multi-component strategies of delirium prevention were found to be effective in declining the rate of both falls and delirium in critically elderly patients during hospitalization **Hshieh, et al., 2015**.

However, **Jeffs et al., 2013**, found out that no effect on the prevalence of delirium. This was due to long time

intervals of assessment of the patients about delirium every 2 days was not probable. Similarly, **Kalani et al., 2013**, indicated that the rate of delirium was only one occasion in their traditional care group, their nursing intervention (Seeing family members out of the visiting hours and listening to the radio for at most one week) had no significance on the incidence of delirium with no statistically substantial variance between their two groups.

The main conclusion of **Avendaño-Céspedes., 2016**, in their study was that their MID-Nurse Study, a scheduled non-pharmacologic nurse-led intervention in an AGU is practical, and that the intervention may decline delirium incidence, prevalence, and severity. While their results are positive, confirmation from the complete MID-Nurse reseaches is required before applying that the intervention is effective. From the researchers' point of view, the delirium rate was decreased may be due to the implementation of multicomponent nursing intervention performed by researchers directly on patients at all period of time stay in ICU until discharged.

This study showed the mean duration of ICU stay among studied critically elderly patients in the intervention study group; it was observed that, the length of ICU stay has been significantly reduced than the control group. This was coordinated with the study by **Needham and colleagues., 2010**, reported a shorter duration of ICU stay and also, shorter length of hospital stays following the application of their quality enhancement program. However, the duration of delirium in our study was not different between both groups, This finding was opposed to another study by **Kang et al., 2018**, a recent systematic review reported that non-pharmacological

interventions for the purpose of preventing ICU delirium were effective in reducing the duration of delirium and the delirium occurrence, but not the ICU length of stay and ICU mortality.

From the researchers' point of view, multicomponent nursing intervention is effective in controlling delirium rates because of regular detection and elimination of the risk factors and that are simple to carry out by health care providers.

Current multivariate investigation used for the analysis of predisposing risk factors for the progress of delirium established that for each 1-point increase in age of our patients, there were 1.7 times (odds ratio [OR], 95% confidence interval [CI], 0.13-5.8) increased odds of delirium while, controlling for other predisposing factors of delirium including malnutrition, dehydration, electrolytes disturbances, infection, hypoxia, sensory & functional impairments. However, **Rivosecch 2016.**, found that the main essential risk factors

associated with delirium were APACHE II after controlling for dementia, mechanical ventilation, age, the non-pharmaceutical practice, and home-based antipsychotic practice.

This study's results are anticipated to be the foundation of improving an assessment system to help educate nursing staff on delirium and provide high-quality nursing services that go beyond the level of symptom control.

Study Limitations

This study has some limitations. A main limitation included patients who were mechanically ventilated who were excluded from the study because a higher acuity level, and administered large dose of sedation for prolonged periods of time, which could introduce bias in response to intervention and results analysis another limitation, the small number of participants was lower than the desired sample size in the classic care group due to a high rate of drop-out.

Table (1): Frequency distribution of Socidemographic data for critically older adult patient with delirium for both group n =60 (n= 60)

Socio-demographic data	Study group (n=30)		Control group (n=30)		Test / P
	No	%	No	%	
Age:					
Young- old (60-)	13	43.33	15	50	0.667
Middle-old (75-)	13	43.33	13	43.3	
Old-old (85+)	4	13.33	2	6.7	
Mean±SD	1.7 ± 0.7022				
Gender:					
Male	19	63.3	21	70	0.584
Female	11	36.7	9	30	
Marital status:					
Widow	4	13.3	3	10	0.693
Single	8	26.7	7	23.3	
Married	17	56.7	20	66.7	
Divorced	1	3.3	0	0	
Level of education:					
illiterate	15	50	15	50	0.741
Read & write	7	23.3	9	30	
Primary school	3	16.7	1	3.3	
Secondary education	5	10	5	16.7	
University education	0	0	0	0	

Data are presented as mean ± SD, or number and percentage (%). P-value < 0.05 is considered statistically significant

Table (2): Frequency distribution of Clinical characteristics of all the study population (n=60)

	Study group (n=30)		Control group (n=30)		P value
	No	%	No	%	
<u>Diagnosis</u>					
COPD	19	63.33	17	56.67	0.824
Interstitial pulmonary fibrosis	3	6.7	2	6.7	
Pneumonia	3	13.3	5	16.67	
Acute severe asthma	5	23.37	6	20.0	
<u>Comorbid diseases</u>					
Hypertension	10	33.3	13	43.3	0.875
Diabetes mellitus	7	23.3	11	36.7	
Anemia	13	43.3	13	43.3	
Coronary artery disease	8	26.7	8	26.7	
Liver diseases	3	10	1	3.3	
Malnutrition	2	6.7	4	13.3	

Current medications					
Benzodiazepines	0	0	0	0	
Antihistamines	1	3.3	1	3.3	
Narcotics (Morphine)	5	16.7	9	30	0.808
Sedatives (Ambien, Lithium)	11	36.7	8	26.7	
Bladder drugs	0	0	0	0	
	2	6.7	2	6.7	
SOFA score (median) IQR	2 (1-6)		3 (1-5)		0.86
APACHE II score (Mean \pm SD)	15.5 \pm 4.0		15.6 \pm 4.1		0.924
Length of stay in ICU (Day) (Mean \pm SD)	2.63 \pm 1.38		5.87 \pm 1.995		0.001

Data are presented as mean \pm SD, or number and percentage (%). P-value < 0.05 is considered statistically significant. COPD: Chronic obstructive airway disease. SOFA: Sequential Organ Failure Assessment. APACHE: acute physiology and chronic health evaluation.

Table (3): Comparison of Richmond Agitation Sedation Scale (RASS) between both groups

Items	Study group (n=30)		Control group (n=30)		P value
	No	%	No	%	
Negative	27	90	8	26.67	0.001
Positive	3	10	22	73.33	

Data are presented as mean \pm SD, or number and percentage (%). P-value < 0.05 is considered statistically significant.

Table (4): Comparison of the incidence of delirium rates by (Intensive Care Delirium Screening Checklist) between both groups

Incidence of delirium	Study group (n=30)		Control group (n=30)		p-value
	No	%	No	%	
Delirium	6	20.0	11	36.7	0.04*
Non delirium	24	80.0	19	63.3	
Total score 0-8	3.73 \pm 1.96		5.43 \pm 1.194		0.001**

Data are presented as mean \pm SD, or number and percentage (%). P-value < 0.05 is considered statistically significant.

Table (5): The frequency of the cumulative incidence of delirium from the second day to the seventh day after nursing intervention between both groups

	Study groups		Control group		P value
	Present N (%)	Absent N (%)	Present N (%)	Absent N (%)	
The Second morning	9(30.0)	21(70.0)	16(53.3)	14(42.4)	0.03*
The Second evening	9(30.0)	21(70.0)	16(53.3)	14(42.4)	0.03*
The third Morning	7(23.3)	23(76.7)	14(42.4)	16(53.3)	0.05*
The third evening	7(23.3)	23(76.7)	13(43.3)	17(56.7)	0.04*
The fourth morning	8(26.7%)	22(73.3)	12(40.0)	18(60.0)	0.04*
The fourth evening	7(23.3)	23(76.7)	13(43.3)	17(56.7)	0.04*
The fifth morning	6(20.0)	24(80.0)	13(43.3)	17(56.7)	0.04*
The fifth evening	5(16.7)	25(83.3%)	13(43.3)	17(56.7)	0.02*
The sixth morning	4(13.3)	26(86.7%)	8(26.7%)	22(73.3)	0.08
The sixth evening	3(10.0)	27(90.0%)	5(16.7)	25(83.3%)	0.19
The seventh morning	1(3.3)	29(96.7)	3(10.0)	27(90.0%)	0.23
The seventh evening	0(0.0)	30(100.0)	3(10.0)	27(90.0%)	0.23

Data are presented as number and percentage (%).P-value <0.05 is considered statistically significant.

Table (6): The distribution of delirium characteristics in the study and control groups

	Study group		Control group		P value
	N	(%)	N	(%)	
Types of delirium					
• Hypoactive delirium	5	16.7	7	23.3	0.97
• Hyperactive delirium	2	6.7	3	10	
• Mixed delirium	5	16.7	6	20	
Duration(h)					
< 28 N (%)	4	13.3	7	23.3	0.69
> 28 N (%)	5	16.7	9	30	
Delirium Index, (range 0–21)	mean ± SD	4.1 ± 4.0		5.4 ± 4.4	0.60

Data are presented as mean ± SD, or number and percentage (%).P-value<0.05 is considered statistically significant.

Table (7): Multivariate logistic regression analysis of the factors that was shown to be predictors of delirium

<i>Delirium</i>	P-value	OR	95.0% C.I.	
			Lower	Upper
Age	0.041*	1.727	0.139	5.811
Risk factors of delirium				
Malnutrition	0.151	-1.526	0.027	1.746
Infection	0.818	0.202	0.219	6.850
immobility	0.894	0.221	0.047	32.830
Electrolyte imbalance	0.596	0.559	0.221	13.809
Dehydration	0.560	0-570	0.083	3.852
Sensory impairments	0.320	1.114	0.338	27.416
Functional impairments	0.626	-0.437	0.112	3.736
Hypoxia	0.706	-0.679	0.015	17.170

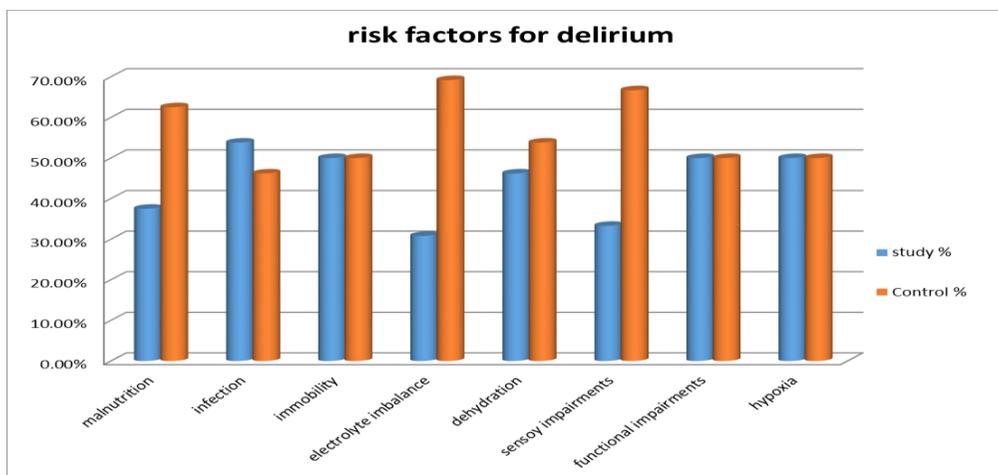


Fig.1: Distribution of the risk factor for delirium in older adult patient with delirium in critical for both group (n= 60)

Conclusion

Multicomponent nursing interventions are effective in controlling rate and duration delirium and improve the patient outcome among the critically ill elderly patients.

Financial support

No funding was received

Conflict of interest

No

Acknowledgements

A special thanks to the RICU at Aswan university hospital, all nurses and physicians at the unit.

Recommendations:

Based on the results of the present study, the current study recommended that:

1- All critical care settings should support multicomponent nursing intervention as high - quality of the nursing care.

2- We recommend that further studies are needed to focus on inducing changes in the health organization, development a strategy for the implementation of nursing preventive procedures, and evaluating the related frameworks.

3- This study suggests education and training for nurses on patients with delirium in the RICU, which in turn may improve the submission of the screening tools for delirium.

References:

Avendaño-Céspedes, A., García-Cantos, N., del Mar González-Teruel, M., Martínez-García, M., Villarreal-Bocanegra, E., Oliver-Carbonell, J. L., & Abizanda, P. (2016). Pilot study of a preventive multicomponent nurse intervention to reduce the incidence and severity of delirium in hospitalized older adults: MID-Nurse-P. *Maturitas*, 86, 86-94.

Bento, M. S. P. M., Marques, R. M. D., & Sousa, P. P. (2018): Delirium: nursing interventions directed to the hospitalized adult patient—a

bibliographic review. *Enfermería Global*, 17(4), 674-688.

Bergeron, N., Dubois, M. J., Dumont, M., Dial, S., & Skrobik, Y. (2001). Intensive Care Delirium Screening Checklist: evaluation of a new screening tool. *Intensive care medicine*, 27(5), 859-864.

Cahill, A., Percy, C., Agrawal, V., Sladek, P., & Truitt, M. S. (2017). Delirium in the ICU: What About the Floor?. *Journal of Trauma Nursing*, 24(4), 242-244.

Cheraghi, M. A., Hazaryan, M., Bahramnezhad, F., Mirzaeipour, F., & Haghani, H. (2017). A Multifactorial Intervention Based on the NICE-Adjusted Guideline in the Prevention of Delirium in Patients Hospitalized for Cardiac Surgery. *International Journal of Medical Research & Health Sciences*, 6(5), 96-101.

Deschodt, M., Braes, T., Flamaing, J., Detroyer, E., Broos, P., Haentjens, P., ... & Milisen, K. (2012). Preventing delirium in older adults with recent hip fracture through multidisciplinary geriatric consultation. *Journal of the American Geriatrics Society*, 60(4), 733-739.

Ghaeli, P., Shahhatami, F., Zade, M. M., Mohammadi, M., & Arbabi, M. (2018): Preventive Intervention to Prevent Delirium in Patients Hospitalized in Intensive Care Unit. *Iranian journal of psychiatry*, 13(2), 142.

Gorski, S., Piotrowicz, K., Rewiuk, K., Halicka, M., Kalwak, W., Rybak, P., & Grodzicki, T. (2017): Nonpharmacological interventions

- targeted at delirium risk factors, delivered by trained volunteers (medical and psychology students), reduced need for antipsychotic medications and the length of hospital stay in aged patients admitted to an acute internal medicine ward: pilot study. *BioMed research international*, 2017.
- Gual, N., Morandi, A., Perez, L. M., Britez, L., Burbano, P., Man, F., & Inzitari, M. (2018).** Risk factors and outcomes of delirium in older patients admitted to postacute care with and without dementia. *Dementia and geriatric cognitive disorders*, 45(1-2), 121-129.
- Hshieh, T. T., Yue, J., Oh, E., Puelle, M., Dowal, S., Trivison, T., & Inouye, S. K. (2015).** Effectiveness of multicomponent nonpharmacological delirium interventions: a meta-analysis. *JAMA internal medicine*, 175(4), 512-520.
- Jayaswal, A. K., Sampath, H., Soohinda, G., & Dutta, S. (2019).** Delirium in medical intensive care units: Incidence, subtypes, risk factors, and outcome. *Indian Journal of Psychiatry*, 61(4), 352.
- Jeffs, K. J., Berlowitz, D. J., Grant, S., Lawlor, V., Graco, M., de Morton, N. A., ... & Lim, W. K. (2013).** An enhanced exercise and cognitive programme does not appear to reduce incident delirium in hospitalised patients: a randomised controlled trial. *BMJ open*, 3(6).
- Kalani, Z., Tavangar, H., & Rahimi, A. (2013).** Effectiveness of nursing interventions on incidence of delirium in patients hospitalized to intensive cardiac care units, Shiraz hospitals, 2012.
- Kang, J., Lee, M., Ko, H., Kim, S., Yun, S., Jeong, Y., & Cho, Y. (2018).** Effect of nonpharmacological interventions for the prevention of delirium in the intensive care unit: a systematic review and meta-analysis. *Journal of critical care*, 48, 372-384.
- Kluger, C., Shah, P., Maiti, S., Babalola, O., Mulvany, C., Sinvani, L., 2018:** Therapeutic advances in the prevention and treatment of delirium in the hospital setting *Am. J. Ther.* 25, e3–e14.
- Macias Tejada, J., Klumph, M., Heslin, K., Le Gros, C. R., Khan, A., Malone, M., & Wardynski, M. (2019).** HELP: A quality improvement project of a delirium prevention program.
- Marcantonio, E. R. (2017).** Delirium in hospitalized older adults. *New England Journal of Medicine*, 377(15), 1456-1466.
- Martinez, F. T., Tobar, C., Beddings, C. I., Vallejo, G., & Fuentes, P. (2012).** Preventing delirium in an acute hospital using a non-pharmacological intervention. *Age and ageing*, 41(5), 629-634.
- McCusker, J., Cole, M. G., Dendukuri, N., & Belzile, E. (2004).** The delirium index, a measure of the severity of delirium: new findings on reliability, validity, and responsiveness. *Journal of the American Geriatrics Society*, 52(10), 1744-1749.
- Mitchell, M. L., Kean, S., Rattray, J. E., Hull, A. M., Davis, C., Murfield, J.**

- E., & Aitken, L. M. (2017):** A family intervention to reduce delirium in hospitalized ICU patients: A feasibility randomised controlled trial. *Intensive and Critical Care Nursing*, 40, 77-84.
- Morandi, A., Pozzi, C., Milisen, K., Hobbelen, H., Bottomley, J. M., Lanzoni, A., ..& MacLulich, A. M. (2019).** An interdisciplinary statement of scientific societies for the advancement of delirium care across Europe (EDA, EANS, EUGMS, COTEC, IPTOP/WCPT). *BMC geriatrics*, 19(1), 1-11.
- Needham, D. M., Korupolu, R., Zanni, J. M., Pradhan, P., Colantuoni, E., Palmer, J. B., ... & Fan, E. (2010).** Early physical medicine and rehabilitation for patients with acute respiratory failure: a quality improvement project. *Archives of physical medicine and rehabilitation*, 91(4), 536-542.
- Pastula, S. T., Hackett, J., Coalson, J., Jiang, X., Villafana, T., Ambrose, C., & Fryzek, J. (2017, January).** Hospitalizations for respiratory syncytial virus among adults in the United States, 1997–2012. In *Open forum infectious diseases* (Vol. 4, No. 1). Oxford University Press.
- Pavone, K. (2019).** Evaluating The Effects Of A Nurse-Led Intervention For Delirium And Pain Management Among Older Adults In The Surgical Intensive Care Unit.
- Pop, M. K., Dervay, K. R., Dansby, M., & Jones, C. (2018):** Evaluation of Richmond Agitation Sedation Scale (RASS) in Mechanically Ventilated in the Emergency Department. *Advanced emergency nursing journal*, 40(2), 131-137.
- Rivosecchi, R. M., Kane-Gill, S. L., Svec, S., Campbell, S., & Smithburger, P. L. (2016).** The implementation of a nonpharmacologic protocol to prevent intensive care delirium. *Journal of critical care*, 31(1), 206-211.
- Schaef, A. (2019).** Assessing for delirium in intensive care unit patients. *Kai Tiaki: Nursing New Zealand*, 25(2), 28-30.
- Sieber, F., Neufeld, K. J., Gottschalk, A., Bigelow, G. E., Oh, E. S., Rosenberg, P. B., ... & Hasenboehler, E. A. (2019).** Depth of sedation as an interventional target to reduce postoperative delirium: mortality and functional outcomes of the Strategy to Reduce the Incidence of Postoperative Delirium in Elderly Patients randomised clinical trial. *British journal of anaesthesia*, 122(4), 480-489.
- Zolfaghari, M., Arbabi, M., Pedram Razi, S., Biat, K., & Bavi, A. (2012).** Effectiveness of a multifactor educational intervention on delirium incidence and length of stay in patients with cardiac surgery. *Journal of hayat*, 18(1), 67-78.