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Intensive care adverse events: An action research project from a Malaysian nursing perspectives

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Introduction

- Intensive care units (ICU) adverse events; ventilator-associated pneumonia (VAP), catheter-related blood stream infection (CRBSI) and pressure ulcers (PU) increase costs of hospitalisation, morbidity and mortality, complicating patient recovery and prolonging length of hospital stay.
- These adverse events can be prevented and outcomes influenced by effective nursing care. (Burston, Chaboyer, Gillespie, & Carroll, 2015)

Method

- An action research project was implemented and the impact assessed using a pretest-posttest survey of nurses and a clinical audit.
- The study intervention involved education regarding a key set of preventive tasks undertaken by nurses.
- This study was conducted in a level 3, 17-bed medical and surgical ICU.

Results

- There was an increase in VAP identification from four to five cases in the pre and post intervention phase. In the pre- intervention phase no CRBSI was detected compared to one case in the post intervention period.
- The PU rate declined from 16 to 6 cases in the post intervention phase. The reduction of the number of patients with PU was statistically significant ($\chi^2=8.14$, $df=1$, $p=0.04$).
- In the pre intervention group there were 81 registered nurses assigned to the ICU at the time of data collection with a response rate of 92.6% ($n=75$). In the post intervention group, there were 83 registered nurses with a response rate of 92.8% ($n= 77$).

Conclusion

- Continuous monitoring and supervising is needed with involvement and support by all levels of medical and nursing administration throughout the process of change for future quality improvement projects in this ICU.

References

Burrell, A. R., McLaws, M. L., Murgo, M., Calabria, E., Pantle, A. C., & Herkes, R. (2011). Aseptic insertion of central venous lines to reduce bacteraemia. Medical Journal of Australia, 194(11), 583-587.

Burston, S., Chaboyer, W., Gillespie, B., & Carroll, R. (2015). The effect of a transforming care initiative on patient outcomes in acute surgical units: a time series study. Journal of Advanced Nursing, 71(2), 417-429.

Meyer, J. (2010). Action research. In K. Gerrish & A. Lacey (Eds.), The Research Process in Nursing (6th ed., pp. 257-270). Oxford: Blackwell Publishing Ltd.

Figure 1. Phases of data collections

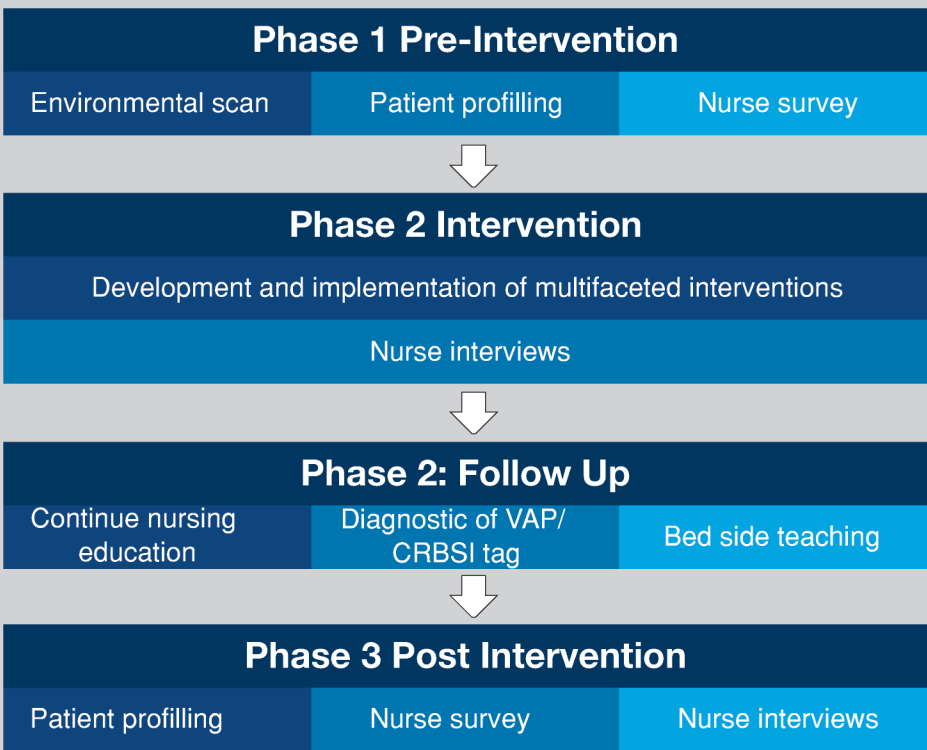


Table 1 Intervention activities

Activities
<ul style="list-style-type: none">Infection control prevention posters and reminder:<ul style="list-style-type: none">Hand washingSafe insertion of CVP lineDiagnostic criteria for VAP, CRBSICentral catheter line insertion team checklistEvidence-based articlesFeedback on hand washing compliance30o head of bed elevation measuring sticksTooth brushing for ventilated patientsContinuous nursing education and bedside teaching<ul style="list-style-type: none">Change to disposable sponging basinUse of chlorhexidine for central line insertion and oral care in ICUSmall tag diagnostic criteria for VAP and CRBSI

Table 2 Pre- and Post- intervention patients with adverse events

Characteristic	Pre- (n=18)		Post (n=10)		Pre- Mean(SD)	Post- Mean (SD)	p
	n	%	n	%			
Case							
Medical	16	88.8	1	10			
Surgical	1	5.6	5	50			
MVA with head injury	1	5.6	4	40			
Sex							
Male	15	83.3	8	80			
Female	3	16.7	2	20			
Age (Years)					57.3 (15.8)	48.6 (20.0)	0.21
Glasgow Coma Scale (GCS)					7.4 (5.0)	6.5 (5.2)	0.49
Charlson Comorbidity Score					3.24 (1.97)	1.1 (1.7)	0.01
Simplified Acute Physiology (SAP II)					46.3 (18.1)	45.0 (15.2)	0.78
Sequential Organ Failure Assessment (SOFA)					8.1 (3.9)	7.0 (2.5)	0.49
Risk of Hospital mortality					44.8 (23.5)	51.6 (23.7)	0.56
Length of ICU stay (Days)					12.2 (7.1)	19.5 (13.4)	0.20
Length of ward stay (Days)					7.2 (9.6)	15.1 (9.5)	0.02
Condition on transfer from ICU							
Dead	7	38.9	3	30			
Alive	11	61.1	7	70			
Condition on transfer from ward							
Dead	7	63.6	1	14.3			
Alive	3	27.3	5	71.4			
Still in the ward	1	9.1	1	14.3			
Type of complication*							
VAP	4	19.0	5	45.5			0.99
CRBSI	1	4.8	0	0			0.26
PU	16	76.2	6	54.5			0.04

*P - value was determined by Chi-squared, other was determined by t - test

Table 3 Pre- and Post- nurse participant characteristics

Characteristic	Pre- (n=18)		Post (n=10)		Pre- Mean(SD)	Post- Mean(SD)
	n	%	n	%		
Gender						
Male	1	1.4	1	1.3		
Female	74	98.6	76	98.7		
Age (Years)					40.8 (21.3)	33.9 (5.8)
Length of service as a nurse (Years)					9.2 (6.2)	10.0 (5.0)
Length of service in ICU (Years)					5.9 (5.0)	6.0 (4.7)
Occupation						
Ward manager	2	2.7	4	5.2		
Registered Nurse	73	97.3	73	94.8		
First Nursing Qualification						
3-years certificate programme	6	8.0	15	19.5		
3-years diploma programme	69	92.0	62	80.5		
Highest nursing qualification						
3-year certificate programme	1	1.3	4	5.2		
3-year diploma programme	46	61.4	34	44.2		
Post-basic critical care	27	36.0	36	46.8		
Post-basic infection control			1	1.3		
Bachelor degree	1	1.3	2	2.6		

Table 4 Pre- and-Post intervention knowledge scores

Knowledge	Pre-	Post-
	Mean (SD)	Mean (SD)
1. Hand washing is important to prevent cross infection.	9.57 (1.23)	9.59 (1.03)
2. Alcoholic antiseptic solution is recommended over soap for hand washing.	8.16 (1.94)	8.07 (1.99)
3. Regular positioning of patients can help prevent VAP and pressure ulcers.	8.21 (1.91)	8.35 (1.88)
4. Elevation of head of bed more than 30 degree is recommended for all ventilated patients.	9.13 (1.30)	8.99 (1.19)
5. Chlorhexidine is recommended prevention of VAP and CRBSI	8.60 (1.59)	8.53 (1.56)
6. Enteral nutrition should be started immediately for all ventilated patients with no contraindication.	9.33 (1.18)	8.93 (1.49)
7. Maximal barrier precautions are recommended to prevent infections in ICU.	9.09 (1.20)	8.95 (1.25)
8. Early mobilization reduces ICU complications.	8.80 (1.05)	9.33 (7.42)
9. Subglottic suctioning can prevent microaspiration in ventilated patients.	8.19 (1.84)	8.07 (1.81)
10. Blood or tracheal secretions culture and sensitivity is recommended if patient shows signs and symptoms of infection.	9.25 (0.89)	8.96 (1.14)
11. Exposure to evidence - based practice can help nurses prevent VAP, CRBSI and pressure ulcers.	9.31 (1.24)	8.99 (1.25)
12. Hygiene can help reduce infection for ICU patients.	9.57 (1.22)	9.23 (1.22)
13. Assessment of pressure area is indicated for all ICU patients.	9.24 (1.06)	8.92 (1.22)
14. Each patient shows specific signs any symptoms if he/she develops VAP and CRBSI.	8.91 (1.68)	8.47 (1.74)

Total Mean Score: Pre-intervention 124.84 SD 14.66
Post-intervention 121.45 SD 16.85

*p - value was determined from T-test t (150) = 1.32, P=.189