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Short Communication

Health-Related Quality of Life and Cognitive Functioning of Intensive Care Unit (ICU) Survivors with Delirium and Non-Delirium States from a Philippine Provincial Hospital

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ABSTRACT

Intensive care unit (ICU) patients and survivors are at risk of developing permanent physical disability, functional deficits and delirium conditions that may affect their psychological and social state. These consequences are known to reduce their health-related quality of life (HrQoL) and cognitive functions. In this study, all ICU patients (N=74) within April to May 2014 in a provincial hospital in Negros Occidental, Philippines were initially considered. From these patients, only 32 survived and were assessed based on their profile and presence of delirium state during hospital confinement and interviewed about their HrQoL and cognitive function 6 months after hospital discharge. The majority were 50 years old and above and were mostly confined due to cardio-pulmonary related conditions. Many patients stayed in the ICU for 10 to 14 days, and most extended their hospital stay for at least 16 days post-ICU confinement. Only 11 survivors (34.38%) were diagnosed with a delirium state. Those with delirium states generally experienced less satisfaction while those without were moderately satisfied in their HrQoL level. Significant differences were observed on the age, length of post-ICU confinement and HrQoL between the survivors with or without delirium states. While HrQoL was found to be highly significant and moderately correlated with the delirium states of the survivors, no apparent significant difference was observed in their cognitive functions. With or without delirium, care and support to enhance cognitive function are important to improve the quality of life of ICU case survivors. To the best of the authors' knowledge, there has been no published report in the Philippines reporting ICU survivors' delirium state, cognitive function and HrQoL until this study.

Keywords: Intensive care unit (ICU), delirium, quality of life, cognitive functioning.

INTRODUCTION

Patients in the intensive care unit (ICU) are at risk of developing delirium, an acute brain dysfunction characterized by changes in consciousness and cognition (Gunther et al., 2008; Jackson et al., 2004). This disorder is associated with serious health problems and long term cognitive impairment, which can lead to decreased quality of life of patients or survivors. It has also been shown to be associated with increased mortality, hospital length of stay and costs (Ely et al., 2001; Jackson et al., 2004; Thomason et al., 2005; Hopkins & Jacknon, 2006; Devlin et al., 2008; Ouimet 2007; Milbrandt et al., 2012).

ICU survivors are predisposed to reduced health-related quality of life (HrQoL). HrQoL has been shown to be significant in assessing the outcome and effectiveness of intensive care. Its concept and determinants have evolved to include other aspects of over-all quality of life that can be clearly shown to affect physical or mental health (Orwelius, unpublished).

In high risk populations, including the elderly, delirium may occur in up to 80% of the ICU cases (Jackson et al., 2004). Spronck et al. (2009) and Reade et al. (2011) added that delirium may even be under diagnosed in ICU patients. In the Philippines, there are no recent published reports about delirium occurrence in ICU patients, or to the relationships between delirium, cognitive function and quality of life of ICU case survivors. Hence, conducting related studies in the local setting will be beneficial to the health care practitioners in the country.

METHODOLOGY

Selection of respondents and research locale

All ICU patients (N=74) in the provincial hospital of Negros Occidental, Philippines from April to May 2014 were initially considered. During hospital confinement, the patients were daily screened (three times) for delirium using the Confusion assessment method (CAM) for the ICU (Ely, 2002) by well-trained nurses. Only 32 patients survived and were interviewed 6 months post-hospital discharge. The provincial hospital in Silay City, Negros Occidental is the biggest in the area and has a 250-bed capacity with 8-bed ICUs. There are 16 health care personnel available every shift at a ratio of 2 personnel per patient if ICUs are fully occupied.

HrQoL and cognitive function of patients

Information on HrQoL and cognitive functioning of the patients were obtained using questionnaires. The HrQoL was assessed using a modified questionnaire patterned from the World Health Organization Quality of Life (WHOQOL) questionnaire developed in 2002 (available athttp://www.who.int/mental_health/publications/whoqol/en/). Questions were scored on a 5-point Likert scale, which included physical and mental health perceptions and their correlates (health risks and conditions, functional status, social support and socio-economic aspects).

On the other hand, assessment of the cognitive functions used a cognitive failure questionnaire (CFQ), a self-reported cognitive functioning questionnaire which consists of 26 questions (Broadbent et al., 1982). CFQ measures consisted of 4 dimensions of cognition: memory, distractibility, social blunders, and names. Each question was also scored on a 5-point Likert scale. The total score on the CFQ ranged from 0 to 100, with higher scores indicating more self-reported cognitive dysfunction.

Data Gathering

Information on the profile was obtained from the hospital records. Respondents were interviewed about their HrQoL and cognitive function in their respective houses. In case where a patient was unable to answer, a person familiar with the condition of the patient (preferably the same person providing information during the ICU admission and with daily or frequent contact with the patient) was interviewed, and observations were made to validate the information obtained.

Data processing and analyses

Obtained data were coded and inputted in a tally sheet, which was subsequently encoded in Microsoft Excel and imported to IBM® SPSS® Statistics Version 23 software. Information on the profile, HrQoL and cognitive functioning of patients were analyzed using simple percentage or weighted means. The significant differences and correlations of the delirium and non-delirium ICU survivors were assessed using Chi-square, Pearson correlation, logistic regression or Spearman's rho for the profile parameters, and Spearman's rho and independent t-test for the HrQoL and cognitive functioning.

Ethical considerations

The study was conducted in accordance with the principles of Helsinki declaration developed by the World Medical Association Informed consent was obtained from the respondents or their representatives. Approval was also acquired from the University Research Center of Southwestern University, the provincial hospital administration and the Office of the Governor of Negros Occidental.

RESULTS AND DISCUSSION

Table 1: Profile of intensive care unit (ICU) patients at the provincial hospital of Negros Occidental within April to May 2014(N=74)

Category[a**]	Sex	Age (years)	Condition	Delirium State[a**]		Total
				Present	Absent	
Survivor	Male	20 to 39	Brain related	-	-	-
			Cardiopulmonary	-	-	-
		40 to 59	Brain related	2	2	4
			Cardiopulmonary	4	5	9
		60 and above	Brain related	1	3	4
			Cardiopulmonary	0	4	4
	Female	20 to 39	Brain related	2	0	2
			Cardiopulmonary	2	2	4
		40 to 59	Brain related		3	3
			Cardiopulmonary	-	-	-
		60 and above	Brain related		1	1
			Cardiopulmonary		1	1
	Total			**11**	**21**	**32**
Non-survivor	Male	20 to 39	Brain related	1	-	1
			Cardiopulmonary	1	-	1
		40 to 59	Brain related	5	1	6
			Cardiopulmonary	5	5	10
		60 and above	Brain related	4	1	5
			Cardiopulmonary	5	1	6
	Female	20 to 39	Brain related	4	0	4
			Cardiopulmonary	1	1	2
		40 to 59	Brain related	2	1	3
			Cardiopulmonary	1	1	2
		60 and above	Brain related	-	1	1
			Cardiopulmonary	-	1	1
	Total			**29**	**13**	**42**

*[a**] p value=0.003 using chi-square test*

Non-surviving patients were mostly found to have delirium states (29 of 42; 69.0%) and cardio-pulmonary related cases (36 of 42; 85%). Most were also male (29 of 42; 69.0%), above 40 years old (34 of 42; 80.96%), and had average stays of 3.14 and 4.14 days in the ICU and Post-ICU in the hospital, respectively. In contrast with the patient survivors, majority were between 50 years old and above (n=18; 56.3%) and male (n=21; 65.6%) and were confined due to cardio-pulmonary related conditions (n=18; 56.3%) (Table1). The usual length of stay in the ICU and post-ICU confinement in the hospital were 10-14 days (n=11; 34.4%) and 11-30 days (n=21; 65.6%), respectively (Table 2). None of the profile parameters were found to be correlated with patient survival except for the delirium state (p value=0.003), indicating that the presence of delirium may influence survivability of the patient. In this study, most of the patients were elderly, which is known to be predisposed to delirium (Pisani et al., 2007). Not all of the patient survivors experienced delirium states (n=11; 34.38%). The reported proportion of delirium patients from the survivors was found to be within the range as reported by most studies.

From the different profile parameters, only age and length-of-stay at the ICU were found to have significant differences between delirium and non-delirium patients (Table 3). Age is a known risk-factor for developing delirium (Pisani et al., 2007). Likewise, Ely et al. (2004) showed that delirium was associated with a longer post-Intensive care unit stay. The same authors also showed association with the average increase in the length of stay in

the hospital for delirium patients, but this observation was not supported in this study. It may imply that post ICU confinement, patient survivors were shortening its stay in the hospital due to the high costs that may be incurred (Pitkala et al., 2008).

Table 2: Length of hospital stay (ICU and post-ICU) and delirium state of patient survivors at the provincial hospital of Negros Occidental within April to May 2014 (n=32)

Parameter	Delirium state		Total	Percentage (%)
	Present	Absent		
Length of stay at the ICU (days)				
1 - 4	-	6	6	18.75
5 - 9	-	8	8	25
10 - 14	6	5	11	34.38
15 - 30	5	2	7	21.88
Mean: 11.06 SD:8.32				
Length of post-ICU hospital stay (days)				
10 or less			7	21.88
11 - 20	5	10	15	28.13
21 - 30	4	2	6	18.75
Above 30	2	2	4	12.5
Mean: 22.16 SD:16.58				

*GWM= General weighted mean, *Significant, **Highly significant, [b]Logistic regression Parameter Limits: 1.00 - 1.80 least satisfied, 1.81 - 2.60 less satisfied, 2.61 - 3.40 moderately satisfied, 3.41 - 4.20 highly satisfied, 4.21 - 5.00 very highly satisfied*

Table 3: Results on the analyses for significant differences on profile, health related quality of life (HrQoL) and cognitive functioning of ICU survivors with or no delirium states from the Provincial Hospital of Negros Occidental, Philippines

Parameter	p value
Age[a]	0.027*
Sex[a]	1.000
Type of disease condition[a]	1.000
Length of stay at ICU[b]	0.014*
Length of stay at hospital after ICU confinement[b]	0.062
HrQoL[b]	0.000**
Cognitive functioning[b]	0.252

[a]Chi-square [b]Independent t-test *significant **highly significant

Delirium patients were found to be less satisfied on their HrQoL level (mean=2.07) than the non-delirium patients (mean=2.78) (Table not shown). A significant difference and correlation were also seen on the HrQoL levels of the delirium and non-delirium patients (Table 5). Pitkala et al. (2008) showed that patients with delirium are more likely to have a decreased HrQoL. Although average cognitive functioning of delirium patients was found to have higher perceptions of self-reported cognitive dysfunction (2.06) than non-delirium patients (1.52), the analysis in this study revealed that there was no significant difference between the delirium and non-delirium patients (table not shown). This is in contrast to the findings of van den Boogaard et al. (2012) where delirium patients were shown to have more serious cognitive problems. This observed difference may be due to the underdiagnosis or the apparent limitation of the CAM method employed in detecting delirium states in the patients (Spronck et al., 2009; Reade et al., 2011), which in turn affects the statistical analysis. Another possible reason is that the present study evaluated the patients only 6 months after hospital discharge while the other studies evaluated the patients for a much longer time (median of 18 months) (van den Boogard et al., 2012). It will be interesting to study further if HrQoL and cognitive functioning of delirium and non-delirium patients change over time, especially in the Philippine setting. In another study, the presence of delirium was found associated with long-term cognitive impairment. Longer durations of delirium from one day to five days can result in a worse cognitive performance a full year after the critical illness (Girard et al., 2012).

The levels of HrQoL between the delirium and non-delirium state of the patients were found to be significantly different and correlated. This implies that the delirium condition may affect the HrQoL of the patients, which similar to the findings of Abelha et al. (2013) but in contrast to the results of van den Boogaard et al. (2012) where no significant difference was observed in the HrQoL of patients with or without delirium states. However, the aforementioned study noted that those with delirium had more cognition problems. Delirium is known to affect the cognition of

patients, which in turn affects their ability to return to work, the essential economic cost and their overall functional ability, and eventually their quality of life (Hopkins and Jackson, 2006). On the other hand, Hopkins and Jackson (2015) showed that the overall function of the quality of life is not significantly affected in every individual whenever the cognitive functioning is impaired. Dregan et al. (2012) found that along with aging, the cognitive function is observed to decline.

In this study, selected profile parameters, delirium states, HrQoL and cognitive functioning of patients were shown to be interrelated. As delirium states maybe underdiagnosed, detecting this condition post-ICU survivors is of primary importance. Results implied the importance of improving the level of special care and attention that must be given to them. With a different healthcare setting and economic status of most patients, further studies are needed to investigate other factors that might affect HrQoL and cognitive functioning of post-ICU survivors.

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