RESEARCH ARTICLE

Evaluation of the level of emotional compatibility in patients undergoing cardiac surgery and its relationship with delirium

Faezeh Soltani[1], Seyyed Fakhraldin Hosseini[1], Farzan Madadizadeh[2], Mansoor Arab[1]

Citation: Soltani F, Hosseini SF, Madadizadeh F, et al. Evaluation of the level of emotional compatibility in patients undergoing cardiac surgery and its relationship with delirium. J Nurs Res Pract. 2020;4(3):1-5.

AIM: Delirium is a common complication following coronary artery bypass grafting (CABG). Delirium is associated with many adverse hospital outcomes. There are several factors that can potentially affect delirium. This study investigated the relationship between delirium level and emotional adaptability in patients undergoing coronary artery bypass graft surgery. This study was aimed to determine. The relationship between Delirium and emotional compatibility of patients undergoing coronary artery bypass graft surgery

MATERIALS AND METHODS: This study is across-sectional correlation study on 250 patients undergoing open heart surgery in the intensive care unit of Alzahra hospital, Kerman in 2019. The data gathering tools was demographic, NEECHAM scale and Emotional Compatibility questionnaires (EAM) data were analyzed using descriptive and analytical statistics (Pearson's correlation coefficient, analysis of variance, regression).

RESULTS: The findings showed there was a significant relationship between Delirium and emotional compatibility (r=0.663, p< 0.000) The mean score of delirium was 19/43 ± 3/83. The results of regression analysis show that, age (%-19) and emotional compatibility (43%)seeking predicted of delirium variance.

CONCLUSIONS: Delirium after CABG surgery is more prevalent in patients with low emotional compatibility. Therefore, the importance of emotional compatibility on delirium after CABG can be the background for Multiple Nursing Interventions**.**

Key Words: *Delirium; CABG; Emotional compatibility*

INTRODUCTION

Delirium is a manifestation of acute brain dysfunction characterized by an acute change in attention, awareness, cognitive function, psychomotor activity, and sleep–wake cycle [1]. Delirium incidence after heart surgery is estimated to be up to 47%. [2]. Delirium is associated with increased mortality, pulmonary dysfunction, and duration of hospitalization following cardiac surgery, and is an independent predictor of long-term cognitive decline in other medical and surgical patient populations [3,4]. Cognitive impairment after recovery from delirium may be long-lasting and the functional ability and quality of patient life may be affected [5]. Compared with other surgical types, coronary artery bypass graft (CABG) and vascular surgery are associated with twice as high rates of postoperative delirium [6].

In 2017, Mohammadi, et al. in a study Titled "Delirium prevalence and related risk factors in patients with head and neck cancer Surgery " that 104 patients with head and neck cancer candidates for surgery in Imam Reza Hospital in Tabriz university of medical sciences were studied, writes that Because of high mortality in delirious patients we can get cognitive tests to recognize high risk persons to prevent [7]. Also elimination of some known risk factors of delirium may cause reduction the length of stay, mortality and morbidity [5]. Identifying individuals at high risk of delirium after cardiac surgery and developing targeted prevention and intervention strategies would be of great public health significance [8]. Emotional compatibility is good mental health, satisfaction of personal life and harmony between feelings, activities and thoughts. Emotional compatibility relates to whether or not someone has the tendency to feel negative emotions and have irrational thoughts as well as to control the impulses when facing a stressful situation [9] low levels of Emotional compatibility may increase vulnerability to stress-and Emotional compatibility is significantly associated with preoperative anxiety and surgical outcomes [10]. Among the Big Five personality traits, emotional instability demonstrates the highest and most consistent associations with each of the burnout components across studies [11]. Aschwanden, et al. support a positive relationship between cognition and emotional stability [12].

In the study of Bajaj, Emotional stability and self-esteem fully mediated the relationship of mindfulness with happiness [13]. The results of the studies show that emotional instability is directly related to some cognitive and psychological disorders such as low self-esteem [14]. Ramos, et al. suggested that the negative emotional responses that have been observed were strongly related to the treatment outcome [10] all nursing are facing significant challenges to cope with delirium. This study was performed with an aim to determine the relationship between Delirium and emotional compatibility of patients undergoing coronary artery bypass graft surgery.

MATERIALS AND METHODS

A cross-sectional, correlational study was conducted among Patients undergoing coronary artery bypass graft surgery at SHafa and Al Zahra hospitals in Kerman from 2019. 250 eligible participants were selected using available sampling from day 1 to day 10 after surgery and considering inclusion and exclusion criteria. Inclusion criteria: 1- Undergoing CABG surgery, for the first time.2-have a stable condition of physically and mentally. 3- Patients informed consent to participate in the research. Exclusion criteria: 1-having serious physical conditions 2-Having an important psychological disorder,3- Being under the psychological treatments, 4- Cognitive impairment or weakness in cognitive functioning of the patient.

For data collection, the following instruments were applied: Demographic questionnaire included items such as age, sex, education level, economic status, History of hospitalization.

The Neelon and Champagne (NEECHAM) Confusion Scale: In this scale, the nurses' 24-hour assessment of the level of processing information, the level of behavior, and the physiological condition rate the patient on a 30 to 0 scale classifying him or her in one of four categories. The cutoff values of 30 to 27 for 'non-delirious' (normal), 26 or 25 for 'at risk', and 24 to 20 for 'early to mild confusion' (mild confusion) were standardized. Validation for delirium against the DSM-III-R criteria was performed for the scores 19 to 0 ('moderate to severe confusion') in the original development of the scale. Consequently, the delirious state can be assessed and changes in the cognitive function of the patient can be monitored. The NEECHAM scale is reliable for the detection of delirium by nurses in the general hospital population and recently has been validated for use in the intensive care

[1]*Nursing, School of Nursing & Midwifery, Kerman University of Medical Sciences, Kerman, Iran;* [2]*Research Center Prevention & Epidemiology of Non-Communicable Disease, Department of Biostatistics and Epidemiology, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; Dept. of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran*

Correspondence: Faezeh Soltani, Nursing, School of Nursing & Midwifery, Kerman University of Medical Sciences, Kerman, Iran, Tel: 9809130424492; e-mail: sfaezeh14@yahoo.com

Received: May 29, 2020, Accepted: July 24, 2020, Published: July 31, 2020

environment. Van, et al study shows good internal consistency (0.85 – 0.90), inter-rater reliability (0.91 – 0.96) and test-retest reliability (0.98) [15]. Emotional Compatibility Questionnaire (EAM) was developed by Robbie et al(9) and has adequate internal reliability In the study of Shokri, et al. (The total internal consistency coefficient and sub-scales range from 84 to 91 percent). This tool is a 28-option which measured using the Likert scale as follows: 0 = rarely or never (less than one day), 1 = occasionally or in few cases (1 to 2 days), 2 = occasionally or a moderate amount of time (3 to 4 days), 3 = most of the time or all the time (5 to 7 days). Validity has been evaluated by 10 comments from experts of Faculty of Nursing Midwifery, Kerman that were confirmed.

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS) version 20 was used for data analysis Frequencies, percent frequencies, mean, and standard deviation was used to describe demographic variables, emotional compatibility and delirium score. Multivariate regression analyses were used to assess the association between emotional compatibility and delirium score and demographic variables. The relationship between delirium and emotional compatibility was analyzed using the Pearson's correlation test since the data were normally distributed. The statistical significance level was set at $p<0.05$.

RESULTS

The majority (70/8%) of patients are female and are married (96%). The demographic characteristics of the samples are indicated in Table 1. Mean age was 58.64 ± 19.54 years. Mean emotional compatibility was 84/98 ± 5/02 that (52.5%) of patients had good emotional compatibility. Mean delirium score was 19/43 ± 3/83 indicating moderate delirium.

No significant difference was found in three groups (good, moderate, weak economic status) using one-way analysis of variance in relation to the mean score of delirium ($p<0.69$) and emotional compatibility ($p<0.47$). There were no significant statistical relation between sex and delirium ($p<0.48$) and emotional compatibility ($p<0.44$) (Table 1).

Pearson's correlation coefficient analysis was used to assess the association between the delirium and emotional compatibility score. As shown in Table 2. There was a significant positive relationship between Delirium level and emotional compatibility ($r= 0.663$, $p<0.001$). Results reveal that increase in age significantly increases the level of delirium. Pearson's correlation coefficient results showed a weak, inverse but significant relationship with both scores, so that the correlation between age and emotional compatibility score was $r=-0.205$ and $p = 0.001$. Correlation between age and delirium score was $r=-0.233$ and $p <0.001$. In general, both correlations indicate that both grades decrease as age grows (Table 2). Simple linear correlation between delirium score with emotional compatibility score (Table 3).

DISCUSSION

In the present study, we investigated the relationship between delirium and emotional compatibility of patients undergoing coronary artery bypass graft surgery. This study demonstrated that delirium is relatively high in patients undergoing coronary artery bypass graft surgery. This finding is consistent with previous research [16,17]. Ackerman, et al reported incidence of delirium among postoperative cardiac patients ranges from 10% to 50% [18]. The unique, fearful, traumatic and unpleasant experiences of these patients might cause delirium.

The results showed that, statistically significant relationship exists between delirium and emotional compatibility. It means that by increasing levels of emotional compatibility. The level of delirium score in patients increases. In fact, emotional compatibility affects cognitive status [12]. Scientists believed that emotional compatibility had a beneficial impact on physical and mental health [19]. Derry, et al say emotional compatibility is a good preoperative for depression after surgery [20]. In the studies we reviewed, the relationship between the delirium and emotional compatibility was not evaluated. The mean of emotional compatibility score was higher in patients with a history of hospitalization and there was a significant difference between two groups with history and without history. There is no statistically significant correlation between emotional compatibility and gender, marital

TABLE 1

The distribution of demographic variables in study subjects.

Variables		Frequency (Percent)		mean ± SD	p-value	
Sex	Emotional compatibility	Female	177	84.36 ± 1.98	0/44	
		Male	73	86.50 ± 2.44		
	Delirium	Female	177	19.24 ± 3.53	0/48	
		Male	73	19.90 ± 2.54		
Economic Situation	Emotional compatibility	Down	171	84.43 ± 2.60	0/47	
		Medium	50	87.98 ± 1.51		
		Good	29	83.06 ± 4.98		
	Delirium	Down	171	19.18 ± 1.01	0/69	
		Medium	50	20.02 ± 1.42		
		Good	29	19.89 ± 2.56		
Education	Emotional compatibility	elementary	195	84.36 ± 3.26	0/3	
		Diploma	49	87.55 ± 1.95		
		Higher education	6	86/07 ± 2/4		
	Delirium	elementary	195	19.09 ± 4.83	0/67	
		Diploma	49	21.04 ± 2.55		
		Higher education	6	19.90 ± 3.55		
Marital status	Emotional compatibility	Single	8	87.75 ± 4.77	0/68	
		Married	240	84.81 ± 3.09		
	Delirium	Single	8	19.25 ± 4.29	0/92	
		Married	240	19/47 ± 2.86		
History of admission	Emotional compatibility	Yes	123	88.47 ± 2.45	0/006	
		No	127	81.38 ± 3.05		
	Delirium	Yes	123	18.78 ± 2.85	0/13	
		No	127	20.07 ± 1.77		
Age	Emotional compatibility	Mean ± SD		58.64 ± 19.54	0/001	R=-0/23
					0/001	R=-0/22

TABLE 2

Correlations between study variables.

N=250	Correlation between emotional compatibility and delirium (r)	p-value
Emotional compatibility	0.663	0.0000
Delirium		
Variable	Correlation between emotional compatibility and delirium with age	P-value
Emotional compatibility	-0.20	0.001
Delirium	-0.23	0.001

TABLE 3

Simple linear correlation between delirium score with emotional compatibility score.

Variable	r-square	Adjusted R-square	p-value
Emotional compatibility	o.44	0.43	0.000

status, Level of Education, The economic situation. It seems More related to personality traits than to demographic characteristics of individuals [21]. The results of the study suggested that there was no significant correlation between delirium and demographic variables (gender, economic situation, marital status, education, History of admission) Except for age. Demographic variables did not emerge as predictors of delirium. Warton, et al. in a study titled "Delirium and Mental Health History as Predictors of Aggression in Individuals with Dementia in Inpatient Settings" concluded that there wasn't a clear link between delirium and demographics [22]. Age emerged as the only variable significantly associated with delirium and emotional compatibility and also age was found to be significant predictors of delirium of patients with CABG. Ashok, et al. also state From age as the significance of specific factor which contribute to the appearance of delirium [23]. CABG among older patients is Common. According to numerous studies [24,25] Old age is the very impressive factor related to delirium.

Creating Delirium is a complex and multi-factorials process whereas, emotional compatibility as another predictor of delirium in CABG patients was identified and can lead to a decrease in the incidence of delirium. Other studies also reported Emotional compatibility to be a major predictor On several factors like (insomnia, cognitive status) [26,27]. Knowing that the ability to adapt emotionally in patients undergo CABG, Prevention of Delirium can be effective. This study has some limitations. The responses from the questionnaires were based on self-declaration; therefore, they are prone to potential errors and misunderstanding of the questions. A cross-sectional design with convenience sampling was adopted in this study. This could be a limitation as selection bias might have occurred for participants.

CONCLUSION

The results of this study indicate moderate level of delirium. On the other hand, it was seen that significant positive association between delirium and emotional compatibility. So with the increase in the level of emotional compatibility, the amount of delirium decreases. The results of this study suggest that we should pay attention to the role of emotional evaluation in patients. We should improve emotional and psychological health.

ACKNOWLEDGMENT

The researchers would like to express gratitude and appreciations to the patients who participated in this study for their effective cooperation.

ETHICAL CONSIDERATIONS

The Ethical Committee of Kerman University of Medical Sciences had approved the study (IR.KMU.REC.1397.527) Aims and methods of the study were explained to the participants, and written informed consent was received from each participant prior to the study. In order to check the inclusion and exclusion criteria of the study, self-reported method was used. They also were informed that their information would be confidential and would be used only for research purpose. In addition, they were ensured that they had the right to refuse participation on the study and that they had the right to withdraw from the study at any time.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY

The data used to support the findings of this study are available from the corresponding author upon request.

REFERENCES

1. Grover S, Ghosh A, Sarkar S, et al. Delirium in intensive care unit: Phenomenology, subtypes, and factor structure of symptoms. Indian Journal of Psychological Medicine. 2018;40(2):169.
2. Oldham MA, Hawkins KA, Yuh DD, et al. Cognitive and functional status predictors of delirium and delirium severity after coronary artery bypass graft surgery: an interim analysis of the Neuropsychiatric Outcomes after Heart Surgery study. International Psychogeriatrics. 2015;27(12):1929-38.
3. Pandharipande PP, Girard TD, Jackson JC, et al. Long-term cognitive impairment after critical illness. New England Journal of Medicine. 2013;369(14):1306-16.
4. Gosselt AN, Slooter AJ, Boere PR, et al. Risk factors for delirium after on-pump cardiac surgery: A systematic review. Critical Care. 2015;19(1):346.
5. Shadvar K, Baastani F, Mahmoodpoor A, et al. Evaluation of the prevalence and risk factors of delirium in cardiac surgery ICU. Journal of Cardiovascular and Thoracic Research. 2013;5(4):157.
6. Gottesman RF, Grega MA, Bailey MM, et al. Delirium after coronary artery bypass graft surgery and late mortality. Annals of Neurology. 2010;67(3):338-44.
7. Mohammadi G, Raofy M, Sadagat K. Delirium prevalence and related risk factors in patients with head and neck cancer Surgery. 31-1025:(12)27;2017.
8. Marcantonio ER. Postoperative delirium: a 76-year-old woman with delirium following surgery. JAMA. 2012;308(1):73-81.
9. Rubio VJ, Aguado D, Hontangas PM, et al. Psychometric properties of an emotional adjustment measure: An application of the graded response model. European Journal of Psychological Assessment. 2007;23(1):39-46.
10. Ahn I-Y, Lee S-J, Han Y-S, et al. effects of emotional stability on Insomnia through Anxiety in Patients with Cataracts. Psychiatry Investigation. 2019;16(1):93.
11. Alessandri G, Perinelli E, De Longis E, et al. Job burnout: The contribution of emotional stability and emotional self-efficacy beliefs. Journal of Occupational and Organizational Psychology. 2018;91(4):823-51.
12. Aschwanden D, Kliegel M, Allemand M. Cognitive complaints mediate the effect of cognition on emotional stability across 12 years in old age. Psychology and Aging. 2018;33(3):425.
13. Bajaj B, Gupta R, Sengupta S. Emotional Stability and Self-Esteem as Mediators Between Mindfulness and Happiness. Journal of Happiness Studies. 2018:1-16.

14. Pardo IM, Balaguer MG, Murillo FH, et al. Self-esteem, emotional stability, social anxiety disorder and suicidal behaviours among transgender youth before gender-affirmative treatment in spain. 20th European Congress of Endocrinology; 2018: BioScientifica.

15. Ono H, Doki Y, Miyata H, et al. Postoperative Delirium After Esophagectomy: The Efficacy of Continual Monitoring Using the NEECHAM Confusion Scale. SAGE Open Nursing. 2018;4:2377960818756799.

16. Thudium M, Ellerkmann RK, Heinze I, et al. Relative cerebral hyperperfusion during cardiopulmonary bypass is associated with risk for postoperative delirium: A cross-sectional cohort study. BMC Anesthesiology. 2019;19(1):35.

17. Jannati Y, Bagheri-Nesami M, Sohrabi M, et al. Factors associated with post-surgical delirium in patients undergoing open heart surgery. Oman Medical Journal. 2014;29(5):340.

18. Ackerman MG, Shapiro PA. Psychological Effects of Invasive Cardiac Surgery and Cardiac Transplantation. Handbook of Psychocardiology. 2015:1-18.

19. Jentsch VL, Merz CJ, Wolf OT. Restoring emotional stability: Cortisol effects on the neural network of cognitive emotion regulation. Behavioural Brain Research. 2019:111880.

20. Derry PA, Rose KJ, McLachlan RS. Moderators of the effect of preoperative emotional adjustment on postoperative depression after surgery for temporal lobe epilepsy. Epilepsia. 2000;41(2):177-85.

21. You J, Wang C, Rodriguez L, et al. Personality, coping strategies and emotional adjustment among Chinese cancer patients of different ages. European Journal of Cancer Care. 2018;27(1):e12781.

22. Wharton T, Paulson D, Macri L, et al. Delirium and mental health history as predictors of aggression in individuals with dementia in inpatient settings. Aging & Mental Health. 2018;22(1):121-8.

23. Ashok V, Pillai M, Puthenkote B. Delirium in Elderly: Is Age the Sole Factor in Determining Prognosis? Journal of the Indian Academy of Geriatrics. 2018;14(3).

24. Raats J, Steunenberg S, de Lange D, et al. Risk factors of post-operative delirium after elective vascular surgery in the elderly: A systematic review. International Journal of Surgery. 2016;35:1-6.

25. Aitken SJ, Blyth FM, Naganathan V. Incidence, prognostic factors and impact of postoperative delirium after major vascular surgery: a meta-analysis and systematic review. Vascular Medicine. 2017;22(5):387-97.

26. Rammstedt B, Danner D, Martin S. The association between personality and cognitive ability:

27. Going beyond simple effects. Journal of Research in Personality. 2016;62:39-44.