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Death Depression and Death Anxiety in Hospitalized Cardiovascular Patients: The Predictive Role of Mental Disorders' Symptoms

Khadijeh Fooladvand[1] (PhD), Salman Zarei[1] (PhD)

1. Department of Psychology, University of Lorestan, Khorramabad, Iran

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Corresponding Author:
Khadijeh Fooladvand,
Department of Psychology,
University of Lorestan,
Khorramabad,
Iran
E-mail: fuladvand.kh@lu.ac.ir

Abstract

Introduction: Mental disorders' symptoms affect bio-psycho-social and spiritual conditions in cardiovascular patients. The current research has aimed to investigate the role of mental disorders' symptoms in the prediction of death depression and death among hospitalized cardiovascular patients.
Method: The study was carried out as a correlational work. The statistical population consisted of all cardiovascular patients admitted to Shahid Madani Hospital of Khorramabad in 2019. For this purpose, a sample of 183 patients (107 males, 46 females) were selected by convenience sampling method. The participants filled out the Derogatis SCL-90-R, Templer Death Depression Scale, and Templer Death Anxiety Scale. Data was analyzed through logistic regression method using SPSS-22 software.
Results: The results indicate that the proportion of death depression and death anxiety in hospitalized patients with cardiovascular disease significantly increases with depression, anxiety, obsessive-compulsive thoughts, and higher age. In addition, the results of logistic regression analysis revealed that depression, anxiety, obsessive-compulsive thoughts, and higher age significantly predict 27.5% to 30.9% and 22.3% to 29.2% of the variance of death anxiety and death depression, respectively ($P<0.001$).
Conclusion: Evaluation of mental disorders in hospitalized cardiovascular patients is recommended to obtain a more reliable prognosis and treatment.

Keywords: Death, Anxiety, Depression, Cardiovascular, Mental Disorders

Introduction

Cardiovascular Diseases (CVDs) affect the heart or blood vessels [1, 2]. They are a major cause of death in the world [3]. Latest studies have shown that the greatest burden of CVDs is on countries with low/middle income, such as Iran. It is estimated that 80% of global CVD deaths happen in such countries [4]. The best way of dealing with these diseases is its prevention and the best way to achieve this is to understand the risk factors of the diseases [5].

There has been a growing interest in the role of transdiagnostic constructs in the development, course, and preservation of psychopathology [6]. A study showed that mental disorders are significantly associated with factors like hospitalization history and existence of stress in patients with cardiovascular diseases. Patients with stress experience within the past year had a higher prevalence of mental disorders [7].

Studies have shown that CVDs affect emotional, social, mental, and economic conditions of patients. Heart injuries do not merely cause physical symptoms and disabilities and the symptoms encompass the mental state of patients as well. Thus, this disease can lead to psychological stresses like death anxiety and death depression [8]. The CVD patients tend to think about their illness and they live with this fear that they may have a heart attack and die any moment [9].

Death is inevitable and the reason for fear of death is quite clear [10]. Death is the strangest phenomenon of life featured with many unknown variables [11]. The anxiety caused by preoccupation with death is called death anxiety. Among the symptoms of death depression, we can mention depressive symptoms due to thoughts or reactions to death [12]. Death anxiety and death depression represent two different constructs and different aspects of one's responses to death [13].

The death depression concept was introduced as a response to evidence on depressive components, suffering and sadness about individuals' own death, others' death, and death in general [14]. There is an association between death depression and significant others' death, depression about impending death, experiencing distress, and death in general [15]. Another study showed a significant correlation between death depression and depression [16].

Death anxiety is a multidimensional concept with four factors, namely fear of suffering, fear of the unknown, fear of personal extinction, and fear of loneliness [17]. Death anxiety is about fearing the end of life and fearing the unknown life afterwards [18]. It was reported [19] that sensitivity to death is stronger in individuals with physical or mental health problems. There is a positive correlation between depression and severity of illness and death anxiety [20]. A significant correlation was also found between the fear of death and religious beliefs in older adults with mental disorders [21]. Moreover, emotion cognitive regulation strategies as a risk factor for mental disorder are key psychological components in predicting death anxiety [22].

Studies have shown that the diagnosis and treatment of CVDs develops stress from different viewpoints. After being diagnosed with the CVDs, anxiety and depressive symptoms, poor sleep quality, and stronger perceptions of uncertainty about the future can create distress and decrease ones' quality of life. Along with routine medical and/or surgical interventions, the patient might even feel physical symptoms that can decrease the quality of life in different ways, which might be persistence. With an increase in symptoms' severity and a decrease in perceived function, patients experience a higher level of distress. However, according to studies, death depression and death anxiety can have a profound effect on a person's life course and illness. Higher levels of death depression decrease effective coping styles [16]. For instance, failure to adhere to treatment is expectable through adopting avoidant coping styles. Death anxiety can be a determinant of health-promoting behaviors both in young and older adults [23]. The relationship between mental disorders' symptoms of death anxiety and depression among patients with CVD has not yet been examined. This is neglected in CVD patients and there is a gap in this area, which adds to the importance and necessity of the present study. The importance of this study lies with the fact that identifying the factors and their role in CVD not only increases knowledge in this field, but also increases the possibility of providing and applying more appropriate preventive strategies and necessary interventions for patients with cardiovascular disease.

Actually, CVD is a psycho-physiological disorder [9], in addition to physical problems, psychosocial factors play a key role in its development and intensification. In spite of the mental occupation of patients with cardiovascular disease, research has failed to investigate the depression and anxiety of death and its association with risk factors in these patients. This study has aimed at answering the following question: Do mental disorders' symptoms predict death depression and death anxiety in patients with CVD?

Method

The study was carried out as a correlational work with a statistical population of all cardiovascular patients admitted to Shahid Madani Hospital of Khorramabad in 2019. For this purpose, a sample of 183 cases (107 males, 46 females) was selected by convenience sampling method. Each patient was examined to make sure that they are at least 18 years of age and have no history or current symptomatology of an organic condition that may create major psychiatric symptoms (e.g., lupus, MS), bipolar I disorder, and schizophrenia. After providing a brief description of the research goals and how the participants should complete the questionnaire, participants individually completed the questionnaires under the supervision of the researcher. In this research, moral considerations, including informed consent and confidentiality of the participants' information, were observed.

The tools used in this study were as follows:

Symptom Checklist-90-R (SCL-90-R) (1984): Derogatis [24] developed the 90-item SCL-90-R, known as obsessive-compulsive thoughts, somatization, interpersonal sensitivity, anxiety, depression, hostility, paranoid ideation, phobic anxiety, and psychoticism, as a self-report inventory for assessing the nine symptom dimensions. In SCL-90-R, every item is rated on a five-point scale of distress (0-4) ranging from "never" to "extremely"; so as to measure the extent to which the respondents have experienced the symptoms listed during the last seven days. Raw scores were calculated via dividing the sum of scores for a dimension by the number of items. The obtained internal consistency was above 0.70 for all the dimensions. Based on test-retest method, the correlation coefficient of the questionnaire was equal to 0.97. Compared to DSM, the sensitivity and specificity of the questionnaire were %94 and %98, respectively [25]. In this study, for the nine dimensions of psychological symptoms, Cronbach's alpha was found to be between .75and .86.

Templer's Death Anxiety Scale (DAS) (1970): This scale covers 15 items that are scored on a five-point Likert scale from 1 (completely disagree) to 5 (completely agree). The total score of the scale ranges from 15 to 75. Lower scores show lower levels of Death Anxiety. Items 2, 3, 5, 6, 7, and 15 are scored conversely [12]. Researchers have [26] reported the results of factor analysis of the questionnaire based on Principal Components Analysis (PC) and

obtained one factor. Moreover, reliability coefficient based on split half method was 0.62 for DAS with a Cronbach's Alfa coefficient equal to 0.73. The correlation coefficient between DAS and the Death Concern Scale and between DAS and Manifest Anxiety Scale was obtained equal to 0.40 and 0.43, respectively [26]. In the present study, Cronbach's alpha for death anxiety was .79.

Templer's Death Depression Scale (DPS) (1990): This scale is a 21-item self-report questionnaire with a Likert format of five options (completely disagree=1 to completely agree=5). Higher scores on the DDS indicate higher death depression [13]. This questionnaire was validated in [8] using content and face validity. Test-retest method was used for 20 patients with CVDs to ensure the repeatability and internal consistency. The Cronbach's alpha coefficient for death depression was estimated to be 0.71. Based on the goodness of fit statistics, the pattern for the questionnaire was fitted on data. In the present study, Cronbach's alpha for death depression was .78.

Descriptive statistics, such as frequency and percent, were calculated. Inferential statistics like Logistic regression were used for analyzing study data using SPSS 22.

Results

In this study, 107 (58.5%) men and 76 (41.5%) women participated. In addition, 32 (17.5%) participants were single and 151 (82.5%) were married. Descriptive findings of the research components are presented in Table 1.

The internal correlation matrix of death anxiety, death depression, and symptoms of psychological disorders are shown in Table 2.

The results of the correlation coefficient shown in Table 2 indicate that the symptoms of psychological disorders have significant relationships with death anxiety and death depression (P<0.01).

Table 3 presents the results of estimating the effect of demographics and mental factors on the prediction of death depression in both raw and adjusted forms. In this regard, 12 predictor variables are entered into the model based on the logistic regression method. As it can be seen, death depression in hospitalized patients with CVD significantly increased with depression (OR: 2.47, CI: 1.13-5.41), anxiety (OR: 1.86, CI: 1.19-2.93), obsessive-compulsive behavior (OR: 1.71, CI: 0.99-2.93), and higher age (OR: 3.38, CI: 1.59-7.16). Additionally, the results of logistic regression analysis showed that depression, anxiety, obsessive-compulsive thoughts, and higher age could predict 27.5% to 30.9% of the variance of death anxiety (P<0.001). The model was fitted with data (Hosmer-Lemeshow test, $\chi2=5.877$, P=0.662) and predicted death depression (Omnibus tests, $\chi2=97.12$, P<0.001).

Table 4 presents the results of estimating the effect of demographics and mental factors on the prediction of death anxiety in both raw and adjusted forms. The proportion of death anxiety was significantly higher with depression (OR: 2.46, CI: 1.14-5.40), anxiety (OR: 1.78, CI: 1.19-3.67), obsessive-compulsive behavior (OR: 1.94, CI: 0.94-3.23), and higher age (OR: 3.09, CI: 1.47-7.12). Moreover, the results indicated that depression, anxiety, obsessive-compulsive and higher age could predict 22.3% to 29.2% of the variance of death anxiety, respectively (P<0.001). The model was fitted with data (Hosmer-Lemeshow test, $\chi2=5.768$, P=0.661) and predicted death anxiety (Omnibus tests, $\chi2=93.17$, P<0.001).

Table 1. Demographic Data

	Frequency	Percent
Male	107	58.5
Female	76	41.5
20-39 years	48	26.3
40-59 years	81	44.2
60-79 years	54	29.5
Single	32	17.5
Married	151	82.5
Duration of Cardiovascular Disease		
Less than a year	99	54.1
1 to 5 year	51	27.9
5 to 10 year	17	9.3
More than 10 years	16	8.7

Table 2. Internal Correlation Matrix of Death Anxiety, Death Depression, and Symptoms of Psychological Disorders

Variables	1	2	3	4	5	6	7	8	9	10	11
Death Depression	1	.39***	.64***	.32***	.53***	.51***	.35***	.17	.15	.14	.33***
Death anxiety		1	.61***	.33***	.56***	.49***	.33***	.21**	.16	.13	.21
Depression			1	.41***	.65***	.64***	.54***	.58***	.51***	.55***	.18
Hostility				1	.54***	.53***	.51***	.44***	.53***	.56***	.30**
Anxiety					1	.57***	.57***	.51***	.49***	.55***	.35***
Obsessive-Compulsive						1	.53***	.49***	.49***	.58***	.38***
Interpersonal Sensitivity							1	.42***	.55***	.50***	.14
Somatization								1	.39***	.55***	.14
Psychoticism									1	.52***	.18
Paranoid ideation										1	.13
Phobic anxiety											1

P <0.01***, P <0.05**

Table 3. Association between Death Depression, Socio-demographic and Mental Disorders' Symptoms in CVDs Hospitalized Patients

Variables	Regression Coefficient	Wald 2	OR	CI	P
Age	1.24	12.11	3.38	1.59-7.16	0.01
Gender	0.39	1.09	1.25	1.09-1.26	0.071
Marital status	0.20	0.31	0.39	0.09-1.67	0.21
Catch duration	0.21	0.32	0.40	.10-1.69	0.20
Hospitalization duration	0.34	0.99	1.01	.43-2.21	0.15
Depression	0.92	8.27	2.47	1.13-5.41	0.02
Hostility	0.31	1.01	1.06	0.46-2.47	0.13
Anxiety	0.79	7.87	1.86	1.19-2.93	0.035
Obsessive-compulsive	0.67	7.66	1.71	0.99-2.93	0.042
Interpersonal sensitivity	0.29	0.38	0.64	0.28-1.45	0.27
Somatization	0.44	0.91	1.01	0.93-1.10	0.191
Psychoticism	0.41	0.87	0.99	0.91-1.07	0.213
Paranoid ideation	0.38	0.79	0.94	0.39-2.22	0.294
Phobic anxiety	0.51	0.95	1.00	0.92-1.09	0.209

Table 4. Association between Death Anxiety and Socio-demographic and Mental Disorders in CVDs Hospitalized Patients

Variables	Regression Coefficient	Wald 2	OR	CI	P
Age	1.09	10.11	3.09	1.47-7.12	0.001
Gender	0.39	0.96	1.12	1.07-1.17	0.093
Marital status	0.19	0.29	1.01	0.10-1.66	0.24
Catch duration	0.22	0.34	0.42	.12-1.74	0.18
Hospitalization duration	0.33	0.94	0.98	.41-2.12	0.16
Depression	0.92	8.27	2.46	1.14-5.40	0.034
Hostility	0.31	1.01	1.09	0.49-2.47	0.18
Anxiety	0.71	7.53	1.78	1.19-3.67	0.031
Obsessive-Compulsive	0.81	7.95	1.94	0.94-3.23	0.03
Interpersonal sensitivity	0.24	0.32	0.69	0.26-1.42	0.26
Somatization	0.46	0.89	1.06	0.91-1.10	0.187
Psychoticism	0.40	0.81	0.92	0.89-1.07	0.22
Paranoid ideation	0.35	0.73	0.87	0.38-2.21	0.27
Phobic anxiety	0.45	0.87	0.93	0.86-1.03	0.21

Discussion

In this study, death depression and death anxiety were estimated based on mental disorders' symptoms in hospitalized patients with CVDs. The results were in line with previous studies [19, 20], showing that depression, anxiety and obsessive-compulsive subscales predicted death depression and anxiety in patients with CVDs. However, the important issue to be mentioned is that in the review of the research background, there was no study investigating the predictive role of mental disorders' symptoms for death depression and death anxiety.

Patients with chronic diseases are angry with themselves, others, and God. They also feel guilt and therefore, such feelings affect their mental health and pains. Therefore, they tend to use weak and ineffective strategies to solve the problems they face in life [27]. Individuals think about death in almost every period of life and a medical condition that increase the risk of death can increase their thoughts about death more than ever [28]. People may feel distress and depression because of excessive thinking about their or other significant others' death. There are numerous studies supporting death-related depression [16].

An emphasis is put on the depressed patient's preoccupation with self by psychodynamic approaches. From a cognitive viewpoint, people with negative cognitions about self, feel depressed. This appears as a pessimistic attributional style and detrimental self-statements [29]. This also holds true for cardiovascular patients. Hopelessness, suffering, loss, and sadness are depressive components that may appear as a response to death [8]. Studies have used words like helplessness, hopelessness, worthlessness, and guilt to refer to somatic symptoms that indicate depression in terminally ill patients [30].

Depression may also be accompanied with somatic symptoms (psychological disturbance, fatigue, and weight fluctuations) and cognitive symptoms (poor concentration and negative cognitions). Symptoms are unspecific and may overlap with individual behavioral attitudes [31]. Depressed patients commonly adopt habits that overlap with cardiovascular disease risk factors, such as sleep deprivation, physical inactivity, smoking and alcohol abuse, poor hygiene, and poor adherence to pharmacological treatments [32, 33]. Nevertheless, many other pathophysiological factors must be taken into account. Psychosocial factors can affect all biological steps leading to atherothrombosis [31].

To explain the relationship between anxiety and obsessive-compulsive behavior and death depression and anxiety, it should be noted that many studies assume a primary effect on these symptoms. This is a new key conceptual step beyond the symptoms and deals with the

cognitive mechanisms disturbed in psychopathology. The level of disability pertinent to general forms of anxiety and depression is mainly a function of a mixture of natural history of recurrence or persistence of symptoms and higher risk of general medical conditions, and CVDs, in particular [34]. An increase in the activity of amygdala is observed in anxious and depressed patients. As mentioned, the functional role of amygdala predicts a wide involvement in all types of emotional disorders, which is supported by psychopathological studies [20]. In addition, rumination can be another cause of common comorbidity of depression and anxiety. The ruminative thoughts' content may also determine whether the individual is anxious or depressed. However, rumination can keep the individual anxious or depressed most of the time [35, 36].

Ruminative processes include attentional biases for negatively valence content, particularly negative information, so that after engaging with such thought processes, it is not easy to stop them or disengage from such content. According to the cognitive model, rumination of negative thought can trigger extra negative cognitive processes, such as attentional biases [37]. Generally, it seems that basic psychological mechanisms like rumination are among the factors leading individuals to suffer from mental disorders that continually occur over time and can play a major role in creating death depression and anxiety.

In addition, age affects death depression and anxiety. Aging is a well-established risk factor for CVD. There is an association between a progressive decline in numerous physiological processes that leads to a higher risk of health complications and disease. The cardiovascular system supplies oxygenated blood to all body tissues. Therefore, its health is a key for other tissues' health and survival. Aging has a key effect on the heart and arterial system, and leads to more CVDs, such as hypertension, atherosclerosis, myocardial infarction, and stroke [38, 39].

This research had specific limitations i.e. small sample size and lack of control on the duration of CVD, physical illness, and gender differences; and thus its generalization to all Iranian patients is limited. The findings should be supported with larger sample groups, such as non-clinical and non-help-seeking groups. Moreover, some of the risk factors like mental disorders were examined through long-term memory and might have been affected by recall bias. Further study on these constructs through other methods (e.g. structured interview) is needed to have a better view of the dynamic relationships between the psychological distress and death depression and anxiety. Future studies are suggested to work on clinician educational projects on patients with regard to manners of appropriate interaction with illness. Moreover, preventive and therapeutic measures for mental disorders in patients with CVDs should be developed and applied.

Conclusion

Depression, anxiety, and obsessive-compulsive thoughts comorbid with cardiovascular patients for reasons, such as rumination, negative attribution styles, pessimism about oneself and the environment as well as hopelessness. In addition to unhealthy lifestyle resulting from both depression and heart disease, which exacerbates negative mental states, negative prognosis of CVD can lead to death depression and anxiety among these patients in long-term.

Conflict of Interest

The authors declare no conflicts of interest.

Ethical Approval

All ethical criteria were met in this paper. The participants were informed about the purpose of the research and its implementation stages. They were also assured of confidentiality. Moreover, they were allowed to be excluded from the study as they wish, and if desired, the results of the research would be available to them.

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