

## ORIGINAL RESEARCH ARTICLE

# Cardiovascular diseases and community mental health

İbrahim Topuz<sup>1,\*</sup>, Ayşe Topuz<sup>2</sup>

<sup>1</sup> Department of Public Health Nursing, Kutahya Health Sciences University, Kutahya 43100, Turkey

<sup>2</sup> Department of Dialysis, Karamanoglu Mehmet Bey University, Karaman 70100, Turkey

\* Corresponding author: İbrahim Topuz, [ibrahimtopuz\\_38gs@hotmail.com](mailto:ibrahimtopuz_38gs@hotmail.com)

### ABSTRACT

Cardiovascular diseases (CVDs) are cited as the deadliest of illnesses. Their incidence and prevalence around the world are steadily rising. CVDs are the cause of approximately one-third of all deaths in the world. It has been stated in empirical studies over the years that poor socioeconomic status, the lack of social support, stress at work and in the family, depression, and psychosocial risk factors such as anxiety and feelings of hostility aggravate the risk of developing coronary heart disease and also worsen the clinical course and prognosis. Additionally, psychobiological, and behavioral mechanisms have been identified in this context. Psychosocial risk factors should be identified in clinical practice and medical results shared with individuals with CVDs, who should also be screened for anxiety, stress, and stress management, as well as for symptoms of depression. Individuals at risk or who are diagnosed as displaying symptoms of anxiety and depression should be referred to psychiatric professionals to ensure that they receive assistance. Cardiac rehabilitation may involve psychosocial interventions that include cognitive behavioral therapy, problem-solving therapy, and stress management programs, applied on their own or together with other interventions. The aim of this review article is to examine CVDs and community mental health, determine which applications may be adopted as standard practice in this context, and raise awareness about this topic among the public and especially among health professionals.

**Keywords:** cardiovascular diseases; community mental health; community mental health nursing; nursing

## 1. Introduction

CVDs are the leading cause of death worldwide<sup>[1-3]</sup>. An estimated 17.9 million people died from CVDs in 2019, accounting for 32% of all global deaths; 85% of these deaths occurred due to heart attack and stroke. Due to this increase in mortality rates, CVDs have been determined to be the deadliest disease<sup>[4]</sup>. Similarly, the rate of heart diseases among total deaths in Turkey tends to increase continuously. It is obvious that CVDs rank first among all causes of death with an average of 40% between 2009 and 2016<sup>[5]</sup>. In addition, in 2017, it was determined that 10.5% of people in the 40–69 age group had heart disease or were at a  $\geq 30\%$  risk of CVDs<sup>[6]</sup>. According to the Turkish Adult Heart Diseases and Risk Factors (TEKHARF) study, coronary disease accounted for 42% of the causes of death in the period between 1990 and 2016 while 12% constituted cerebrovascular diseases. Turkey is among the countries with the highest mortality rates from coronary heart disease between the ages of 45–74 in Europe<sup>[7,8]</sup>. More than three-quarters of deaths from CVDs occur in low- and middle-income countries. Of the 17 million premature deaths (under 70 years) due to non-communicable

#### ARTICLE INFO

Received: 12 March 2023 | Accepted: 19 April 2023 | Available online: 02 May 2023

#### CITATION

Topuz İ, Topuz A. Cardiovascular diseases and community mental health. *Cardiac and Cardiovascular Research* 2023; 4(1): 2284. doi: 10.54517/ccr.v4i1.2284

#### COPYRIGHT

Copyright © 2023 by author(s). *Cardiac and Cardiovascular Research* is published by Asia Pacific Academy of Science Pte. Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), permitting distribution and reproduction in any medium, provided the original work is cited.

diseases (NCDs) in 2019, 38% were due to CVDs. Most CVDs can be prevented by addressing behavioral risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity, and the harmful use of alcohol. It is important to detect CVDs as early as possible so that counseling and medication can begin<sup>[9]</sup>.

It has been stated that the healthcare costs associated with CVDs in Europe amounted to over €210 billion in 2017<sup>[10]</sup>; this cost was approximately \$351 billion in the United States between 2014 and 2015. The medical costs of coronary heart disease in the USA are expected to double from 2015 to 2030<sup>[11]</sup>. When the distribution of causes of death according to the ICD-10 (International Classification of Diseases) main diagnosis groups is examined for Turkey, it can be seen that circulatory system diseases, predominantly CVDs, take first place with 39.7%<sup>[6]</sup>. For this reason, CVDs pose a significant economic burden for the public, leading to the need for an effective approach to the prevention of CVDs<sup>[12]</sup>. In order to reduce morbidity and mortality associated with CVDs, risk factors should be identified so that prevention strategies can be created and early intervention can be initiated for persons with high and very high CVDs risk<sup>[4]</sup>. Two basic strategies, primary and secondary, are valid and complementary to each other in the prevention of CVDs<sup>[13–15]</sup>. It is known that stress<sup>[16]</sup>, depression<sup>[17]</sup>, anxiety<sup>[18]</sup>, and mental disorders<sup>[19]</sup> are more common in individuals with CVDs. Evaluating the mental health of individuals with CVDs and taking preventive measures is an important issue<sup>[19]</sup>. From this perspective, the aim of this review article was to examine CVDs and community mental health.

## **2. Cardiovascular diseases and psychosocial interventions**

Psychological interventions in the prevention of CVDs have not been adequately studied<sup>[20]</sup>. According to clinical guidelines, diagnosis is the first step in preventing psychosocial risk factors, and the core questions that should be asked when evaluating the person are listed below. Answering “yes” to one or more of these queries reveals increased risk<sup>[21]</sup>.

- Is your schooling higher than the compulsory education level (primary education)? Are you employed as a worker? (reveals low socioeconomic status)
- Do you lack control in meeting demands at work? Is your reward not in line with your effort? Are there any major problems in your relationship with your spouse? (reveals work and family stress)
- Do you live alone? Do you feel the lack of a close confidant, or do you lack confidence? Do you feel the lack of anyone who can help you in case of illness? (reveals social isolation and lack of social support)
- Do you feel depressed, depressive, hopeless? Do you feel a loss of interest and pleasure in your life? (reveals depression)
- Do you often feel angry about little things? Are you often disturbed by other people's habits? (reveals anger and hostility)
- Do you often feel anxious, worried, distressed, or tense? Do you often have trouble controlling or stopping your anxiety? (reveals anxiety)
- Do you usually feel depressed, anxious, irritable? Do you find it difficult to share your feelings and thoughts with other individuals? (reveals type D personality-type D personality is characterized by a tendency to experience negative emotions and inhibiting these emotions by avoiding social relationships)

Telephone interventions, face-to-face or web-based counseling, peer support, self-management programs, stress reduction methods, cognitive behavioral therapy, and psychodynamic therapy methods are used to reduce cardiovascular risk. These practices affect mental health and lifestyle positively, but there is insufficient evidence about their effectiveness in reducing cardiac risk<sup>[20,21]</sup>. Practices such as reducing risky health behaviors and improving health, the early recognition and treatment of depression, which is a public health problem, should be prioritized in health services. Addressing the psychological reactions of people living with CVDs, meeting their psychosocial needs, and treating psychiatric disorders are essential to achieving the goal

of both holistic care and increasing the quality of life. This goal can be achieved with the cooperation of the cardiology and consultation-liaison psychiatry team. Psychosocial interventions that the primary treatment team can apply include biopsychosocial assessment, screening for depression and anxiety in all individuals, the therapeutic relationship, personal information, activating social support systems, and directing individuals at high risk of psychological problems (distress) to seek professional mental health help. Stress management, motivational interviews, psychoeducation, problem-solving therapy, cognitive behavioral and interpersonal psychotherapy, and psychotropic drug therapy, if necessary, are used in the psychological treatment and care of the referred individuals<sup>[22,23]</sup>. These initiatives can be implemented individually or as a group. They may also be part of comprehensive cardiac rehabilitation or they can be performed separately from the components of rehabilitation therapy. In a study examining the effectiveness of psychological interventions, it was found that mild-to-moderate reductions in depression and anxiety and reductions in cardiac mortality could be achieved. However, it was found that there was no reduction in MI, the need for cardiac surgery, or in the overall mortality rate<sup>[24]</sup>.

The importance of cardiac rehabilitation in reducing risk factors and preventing cardiac mortality and morbidity in these individuals is obvious. According to the guide prepared by the British Cardiovascular Society in 2012, Persons participating in a cardiac rehabilitation program have a wide range of emotional problems, and therefore a comprehensive, holistic review is essential in order to achieve the desired results. When anxiety and depression are not well managed or treated, cardiac rehabilitation can fail. The guide recommends examining anxiety and depression with an appropriate measurement tool, examining other related psychological factors, including self-efficacy and illness perceptions for health behavior change, and also reviewing quality of life with an appropriate measurement tool. It is stated that those with clinical depression, anxiety, or chronic psychiatric disorders should be appropriately referred to mental health services<sup>[25]</sup>. In the two-year study by Child et al.<sup>[26]</sup> which integrated cardiac rehabilitation with the progressive care model developed with the aim of providing individuals more accessible and acceptable psychological care, thus improving mental health findings, 108 individuals were examined. It was reported that anxiety decreased by 19% and depression by 13% at the conclusion of the research<sup>[26]</sup>. In the research, interventions presented in the progressive care model included:

- Psycho-educational sessions: These are sessions in which risky behavior and compliance issues related to all individuals in the cardiac rehabilitation environment are discussed.
- Brief personal therapy: This is cardiac-focused personal therapy in the form of sessions (1–6 times) that is applied to individuals with serious psychiatric disorders.
- Personal therapy using cognitive behavioral methods: This therapy is aimed at facilitating the adaptation to depression, anxiety, and difficult life conditions; 4–26 sessions are held according to the needs of the individuals.
- Brief personal therapy for individuals with significant psychiatric disorders: This therapy consists of 1 to 6 sessions and focuses on cardiac issues and reducing risk and stress levels.
- Group work: This involves a small group of 3-8 individuals; 8 sessions are held<sup>[26]</sup>.

Cognitive Behavioral Therapy is accepted as a short-term, effective psychosocial treatment for depression that focuses on identifying dysfunctional thoughts, improving self-efficacy, while introducing alternative behavioral skills<sup>[27]</sup>. In a systematic review of nine randomized controlled studies that include individual or group behavioral self-management techniques, it was determined that there was improvement in angina symptoms, physical limitations, and depression scores<sup>[28]</sup>. A study including social cognitive-based interventions given by telephone in Australia revealed that individuals' quality of life, physical activity levels, body mass index, and alcohol consumption findings improved<sup>[29]</sup>. It was found in a randomized controlled

study conducted by Yousefy et al.<sup>[30]</sup> with coronary artery patients that individuals who participated in the Cognitive Behavioral Therapy program, which was applied for eight sessions, each for two hours, significantly decreased anxiety and increased the participants' quality of life<sup>[30]</sup>. The techniques applied to individuals in the Cognitive Behavioral Therapy program in the research were as follows:

- Informing individuals about the symptoms of anxiety and its underlying causes,
- Explaining to individuals the rationale behind Cognitive Behavioral Therapy,
- Helping to identify negative thoughts in individuals,
- Replacing logical thoughts with negative automatic thoughts,
- Teaching relaxation techniques,
- Teaching effective communication techniques,
- Teaching systematic desensitization techniques to deal with stressful situations,
- Teaching the timing of activities and assertiveness techniques,
- Explaining the relationship between moods and thoughts,
- Stopping negative thoughts<sup>[30]</sup>.

Problem-Solving Therapy has been applied both in the prevention of psychiatric disorders and in therapeutic programs since the 1970s. Studies have revealed that the problem-solving ability of the individual has a mediating role in the relationship between negative life events and depression<sup>[31]</sup>. According to the findings of Nezu, people with high stress levels and effective problem-solving skills have much less depressive symptoms than those with the same stress level but with ineffective problem-solving skills<sup>[32]</sup>. It was found in the finding of a meta-analysis study in which 21 studies were examined that the effect of Problem-Solving Therapy was equal to the impact of other psychotherapies and medical treatments in reducing depressive symptoms, and it was also significantly more effective than in the control group whose participants did not receive treatment but were supported through interviews<sup>[33]</sup>. In the research in which Gellis and Bruce applied Problem-Solving Therapy to people with CVDs and sub-threshold depression in homecare, it was determined that depressive symptoms decreased and that the quality-of-life subgroups of mental health and emotional role functions increased<sup>[34]</sup>. In another study on home care, an integrated telehealth initiative was applied to elderly individuals with noncommunicable diseases (chronic obstructive pulmonary disease and heart failure) and depression in home care. Interventions implemented by the tele-health nurse included the daily monitoring of individuals' symptoms, body weight, drug use as well as 8 sessions of Problem-Solving Therapy. As a result, it was found that the depression scores of the individuals decreased by 50%, their problem-solving skills and self-efficacy skills in managing the medical condition increased significantly and, meanwhile, the number of emergency visits decreased<sup>[35]</sup>.

Stress management programs are traditionally based on relaxation training. Full relaxation training, seen as a form of stress management, helps individuals cope with stress and tension. A systematic review of the efficacy of relaxation therapy included 27 studies. According to the physiological findings of the systematic review study, it was determined that there was a decrease in resting heart rate, an increase in exercise tolerance, HDL (High-Density Lipoprotein) cholesterol levels, and heart rate variability. According to the psychological findings, it was determined that relaxation therapy reduced state depression and anxiety but did not have an impact on trait anxiety. When cardiac effects were examined, it was found that there were decreases in arrhythmia, exercise-induced ischemia, and angina pectoris. There was also an increase in return-to-work rates<sup>[36]</sup>.

There are various programs that target stress management. One of them is the Freeze-Frame stress management program, which is a technique of refocusing on positive emotions, applied in five steps in stressful situations in daily life. It provides an instant intervention for people to protect and greatly reduce the stress

caused by unconstructive or inappropriate emotional reactions. It has three main components: modification (shifting attention to the area of the heart), activating (positive emotions), and perception (seeking the best perspective or attitude for the situation)<sup>[37]</sup>.

Luskin et al.<sup>[16]</sup> who applied eight sessions of the Freeze-Frame stress management program to older adults with heart failure reported a significant improvement in perceived stress, emotional distress, and depression levels as well as in the 6-minute walk test. They also noted increases in emotional coping and functional skills<sup>[16]</sup>. Relaxation therapy based on mindfulness is another stress management program. Achieving mindfulness involves focusing one's attention, and without judgment, concentrating on the present. This is a method of developing conscious attentiveness. The practice of mindfulness involves understanding, becoming open and nonjudgmental, and developing curiosity. The basic principle of mindfulness is accepting everything perceived as it is, without trying to change anything<sup>[38]</sup>. Sullivan et al.<sup>[39]</sup> conducted a mindfulness-based psychoeducation intervention for individuals with heart failure to assess its impact on quality of life, depression, and clinical findings. The program was applied to participants for eight weeks, each session taking 2–2.5 h. The interventions included coping skills training, mindfulness-based stress reduction techniques, and support group discussions. The findings showed that the interventional program significantly reduced depression and anxiety and had a positive effect, compared to the control group, on heart failure symptoms and quality of life<sup>[39]</sup>.

Despite the fact that risk factors have been identified, acute events are promptly and appropriately handled with more advanced medical treatments at this time, causing a significant drop in CVDs rates, CVDs continues to be a leading cause of death on a global scale. New risk factors and modifications regarding the development and progression of this condition should be examined. Stress has been singled out as an important risk factor that triggers the acceleration of atherosclerosis and acute CVDs events. In the last ten years, evidence has built up pointing to the biological, neuroanatomic, and neurophysiological effects of stress and to the benefits of developing endurance. The pathophysiology of stress is complex and together with related metabolic, inflammatory, and hemostatic anomalies, involves the brain, the autonomic nervous system, and the endocrine system. Most application manuals accept the importance of screening for stress as part of preventing primary and secondary CVDs. There are however a limited number of broad, measurable and affordable approaches to stress intervention. There are two potential stress-reducing strategies: population-based strategies and strategies with narrower targets for clinical practice<sup>[40]</sup>.

Increasing evidence points to the relationship between CVDs and psychosocial stress. In the last decade, a small number of studies have revealed that stress plays a major role in the progression of CVDs and in the emergence of CVDs events. Pooling the results of smaller studies has made it possible to assess more accurately the correlation between stress and CVDs and other cardiac conditions such as arrhythmias<sup>[41]</sup>. Differing from other risk factors, by its nature, psychosocial stress is heterogeneous and can be directly or indirectly associated with interpersonal relationships, previous trauma, financial limitations, problems with employment, neighborhood, community and societal issues, political issues, racial discrimination, gender inequality and other inequities<sup>[42,43]</sup>. The shortage of recognized effective and measurable interventions to explore the correlation between CVDs and stress in clinical practice still continues<sup>[40]</sup>.

In general, data related to stress as a trigger for events such as myocardial infarction are more robust than data associated with stress as a risk factor for developing CVDs. Many studies have examined acute mental stress, angina, acute myocardial infarction, arrhythmias and sudden cardiac death as triggers for CVDs<sup>[44–47]</sup>.

Different types of stress are associated with different degrees of CVDs outcomes. Work stress is more likely to be associated with physical inactivity and smoking<sup>[48]</sup>. In the British Whitehall II study, it was found

that the likelihood that individuals experiencing long-term stress would conform to a healthy diet was lower<sup>[49]</sup>. Mental stress-based myocardial ischemia is associated with doubling the total mortality risk<sup>[50]</sup>. In individuals with stable coronary heart disease, moderate or more intense permanent psychological stress is significantly associated with higher rates of cardiovascular risk (hazard risk [HR] = 3.94; 95% CI, 2.05–7.56;  $P < 0.001$ ) and mortality due to all causes (HR = 2.85; 95% CI, 1.74–4.66;  $P < 0.001$ )<sup>[51]</sup>. It appears that an increase in different types and levels of stress contributes to poorer CVDs outcomes. The INTERHEART study examined the relationship between psychosocial factors and myocardial infarction in 24,767 individuals in 52 countries<sup>[52]</sup>. Types of stress have been identified as psychosocial stress, stress at home, stress over financial matters and major life events in the previous year. Individuals experiencing myocardial infarction display a higher prevalence of the four stress factors compared to controls ( $P < 0.001$ ). A 27-year follow-up of 136,637 individuals recorded in the Swedish National Patient Register reports a hazard ratio of HR 1.64 (95% CI, 1.45–1.84) for any CVDs for the first year after the diagnosis of an event related to stress<sup>[53]</sup>.

Arrhythmias such as atrial fibrillation and ventricular tachycardias can be associated with psychological stress. In patients with a cardioverter defibrillator, a significant increase was seen in ventricular tachyarrhythmia after terror attacks<sup>[54]</sup>. The perception of intense stress and anger experienced by individuals suffering from heart failure is associated with worsening functionality<sup>[55]</sup>. More than half of patients presenting with stress cardiomyopathy have more neurological and psychiatric disorders than those with acute coronary syndromes<sup>[56]</sup>.

Mental illness is also significantly associated with CVDs<sup>[57]</sup>. Schizophrenia, bipolar disorder, major depressive disorder, anxiety, disorders, continuous or intensive stress or post-traumatic stress disorders are independently associated with increased CVDs risk. Conversely, these conditions are prevalent among individuals with CVDs and may contribute to an increased morbidity and mortality risk. About 20% of individuals with coronary acute coronary syndrome have acute stress disorder that can potentially turn into post-traumatic stress disorder<sup>[58,59]</sup>.

Moreover, stress has an indirect effect on CVDs through the adaptation of inappropriate lifestyles, by delays in seeking treatment for the symptoms of acute cardiac events, poor personal care, reduced compliance with drugs taken for heart failure, and a lower propensity to making lifestyle changes. Successfully participating in cardiac rehabilitation practices<sup>[41]</sup> may lead to positive outcomes.

### **3. Relationship between cardiovascular diseases and psychiatric disorders**

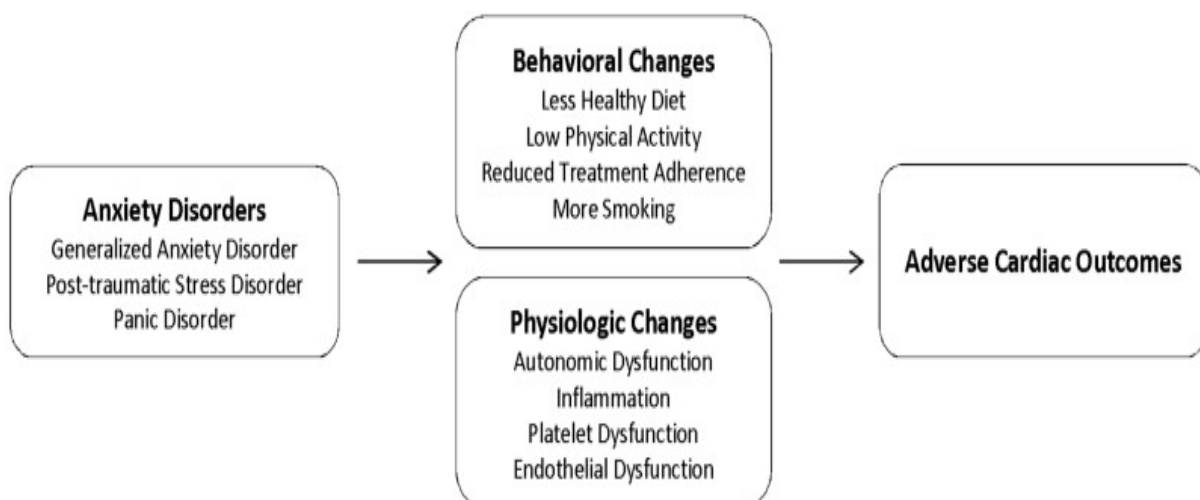
Experiencing CVDs leads to various psychological reactions. Although people are aware that they are mortal beings, they still want to believe that “nothing will happen to me”. Death denial becomes difficult however after CVDs, which is probably the most fundamental difficulty people have to face. In addition, concerns about control, autonomy, dependency, loss of energy, self-worth, loss of life, and sexuality often come to the fore. It may be that heart patients initially choose a path of denial, downplay their cardiac condition (naming it as only “a minor attack”), or attribute their symptoms to a non-cardiac cause (as gas pain). This response is part of the acceptance process, but there is an urgent need for action if denial prevents individuals from seeking and continuing treatment. On the other hand, some people may be overly preoccupied with minor physical symptoms, they may be avoiding physical activity, and rates of emergency admissions may be increasing<sup>[60]</sup>. In some clinical situations, however, mental and cardiac symptoms coexist, and it can be challenging trying to distinguish whether the resulting condition is related to a mental or cardiological condition<sup>[61,62]</sup>.

Depression is common and its incidence is reported to be 15%–20% in individuals with acute MI, coronary disease, and unstable angina pectoris<sup>[60,63]</sup>. The prevalence of depression in inpatients is between

17%–27%<sup>[64]</sup>, and in a study conducted in Turkey, 35.3% of individuals with CVDs are at risk of depression<sup>[17]</sup>. Negative psychological states are common in individuals with CVDs. Given its high prevalence and association with poor heart health, particularly in patients who have had a major cardiac event such as acute coronary syndrome, depression has so far received the most attention in this population. However, recently, anxiety has emerged as another important psychological construct that is quite common, often co-occurring with depression, and may inhibit response to depression treatment and ultimately affect the course of cardiovascular disease independent of depression<sup>[18]</sup>. After MI (Myocardial Infarction), one in five individuals matches the diagnostic criteria for major depressive disorder<sup>[19]</sup>, which is three times this rate in the general population<sup>[65]</sup>. In a systematic review finding that depression negatively affects disease progression, 52 studies and 4 meta-analyses were examined, and it was revealed that there was a strong correlation between depression and negative clinical findings<sup>[66]</sup>. The presence of depressive disorder after MI is three times more associated with the risk of death, independent of standard risk factors<sup>[67]</sup>.

Like coronary arterial disease, anxiety is frequently seen in individuals with CVDs. Twenty to thirty percent of patients experience high levels of anxiety after suffering acute coronary syndrome<sup>[68,69]</sup>. While anxiety can be a temporary experience for some individuals after acute coronary syndrome, half of the cases live through anxiety up until a year after the event<sup>[68]</sup>, suggesting that this state may be a chronic condition for may with heart disease. A study conducted on this subject revealed similar prevalence rates in individuals with coronary arterial disease who were awaiting coronary artery bypass grafting surgery. In this population, 25% of patients experience a high level of anxiety prior to the procedure and in many, symptoms diminish in the months following surgery<sup>[70]</sup>. Anxiety is also prevalent among individuals suffering from other forms of heart disease. A recent meta-analysis by Easton et al. that included 38 studies reveals an estimate that 32% of individuals with heart failure experience anxiety and 13% meet the criteria for anxiety disorder<sup>[71]</sup>. Anxiety also affects about 20% of individuals with more advanced heart failure who need left ventricular assist device implantation<sup>[72,73]</sup>. Anxiety can also be found in about 20% – 40% of individuals who have had an implantable cardioverter defibrillator implanted to prevent the development of fatal arrhythmias<sup>[74]</sup>.

The relationship between anxiety and cardiovascular health is a complex one. Anxiety may be a normal reaction to a stressful situation such as an acute cardiac event, and if it leads the individual into increased participation in healthy actions (e.g., regular exercise, compliance with medicinal regime), anxiety may actually be beneficial. On the other hand, when the stress is excessive or continues for an extreme length of time, it is accepted that anxiety will be detrimental to both psychiatric and general health (**Figure 1**)<sup>[75,76]</sup>.



**Figure 1.** Potential mechanisms mediating the relationships between anxiety and heart health<sup>[18]</sup>.

The relationship between anxiety and cardiac outcomes in individuals with cardiac dysfunction is relatively weak. Four prospective studies on the relationship between anxiety and heart health in individuals with heart failure<sup>[77–80]</sup> and another prospective study on 153 adults who received outpatient care for heart failure reported in unadjusted analyses that there is a marginal relationship between anxiety and mortality. However, when the common variables were examined, it was found that this relationship was insignificant<sup>[77]</sup>. Another study with 643 individuals with heart dysfunction followed up on individuals for an average of three years in order to examine the prospective relationship between psychological distress (a combination of depression and anxiety) and mortality. A marginal relationship was found between depression/anxiety and mortality in the unadjusted analyses, but an examination of this relationship revealed only a negligible correlation<sup>[80]</sup>. In two other studies, no significant relationship was found between anxiety and heart health in either adjusted or unadjusted analyses<sup>[81,82]</sup>. Similarly, while anxiety was found to be a good indicator of negative findings in individuals with cardiac dysfunction in other studies conducted with individuals with coronary arterial disease, the actual relationship between anxiety and outcomes can sometimes be explained by other factors<sup>[83,84]</sup>.

#### **4. Cardiovascular diseases and community mental health nursing**

Nursing services do not only encompass achieving clinical outcomes but also deal with ensuring mental health and psychological care. Because of this, it is of vital importance in healthcare services that the mental health of older adults, especially those with cardiovascular diseases, is evaluated<sup>[85,86]</sup>. The mental health of individuals with CVDs admitted to hospitals is at risk and complications such as anxiety and depression may arise as a result of their hospitalization<sup>[87]</sup>. Additionally, anxiety and depression are commonly observed as complications of heart disease, and they are outcomes that may be triggered or exacerbated by the medical team<sup>[88]</sup>. Hospitalization can be the cause of stress and anxiety that lead to anxiety<sup>[89]</sup>. Anxiety and depression increase the heart rate, blood pressure, cause hemodynamic imbalance, also raising cortisol levels<sup>[90,91]</sup>.

A descriptive, cross-sectional, correlational study conducted with 250 individuals with CVDs in Iran reveals that most of the participants felt they received the desired quality of nursing care. All of the individuals displayed low levels of hospital anxiety and depression. An inverse relationship was reported in the study between hospital anxiety and the quality of nursing care<sup>[92]</sup>. The results of this study are consistent with other studies that assess the quality of nursing care at the hospitals<sup>[87,93,94]</sup>. Findings from the same study are also consistent with the results of other studies<sup>[88,89]</sup> that reveal an increase in anxiety and depression among older adults being treated in the Coronary Care Unit. The differences between studies can be originating from the anxiety and depression measurements taken by units of hospitals under poor clinical governance. There are opportunities to make improvements in the safety and quality of clinical practices through clinical governance at the hospitals<sup>[95]</sup>. Ensuring clinical governance is one of the most important strides taken in healthcare systems. The concept of clinical governance refers to providing high quality care on the part of all healthcare professionals and offering the performance of services at suitable costs<sup>[96]</sup>. Hospital anxiety and depression may have an adverse effect on the health issues (such as hemodynamic instability) patients may have during their stay at the hospital. The level of anxiety among individuals with CVDs is relatively high and therefore it is important to evaluate older adults with CVDs in terms of their mental health<sup>[97]</sup>. It is for this reason that action must be taken to reduce anxiety and depression at the hospitals<sup>[92]</sup>. Public health and community psychiatric nurses shoulder an important role in this context. The findings of this study also indicated that older adult females had higher levels of anxiety and depression than their male counterparts. Psychological disorders are a risk factor for CVDs, a finding that has been confirmed by the studies of Polikandrioti et al.<sup>[87]</sup>, Khan et al.<sup>[88]</sup> and Orujlu et al.<sup>[94]</sup>. Bastani et al.<sup>[92]</sup> reported low levels of anxiety and depression among the participants in their study. The main reason for this could have been the positive clinical governance and elderly-friendly



environment at the hospitals<sup>[89,90]</sup>. Studies conducted in the future should concentrate on qualitative approaches to the adoption of new health policies as well as on the quality of care provided to older adults and the impact of this care on mental health<sup>[98]</sup>. To make the shift from routine practices to innovative approaches, health professionals must make clinical governance a priority<sup>[99,100]</sup> showed in their study in Iran that nurses were suitably equipped to provide care at the hospital and that this was a factor that could bring patients satisfaction and a positive hospital experience. Public mental health nurses have an important role in the prevention and management of anxiety and depression, both prevalent complications of CVDs.

Chronic heart failure is one of the most common physical problems in the elderly. This disease causes numerous disabilities and is also one of the leading reasons for the elderly to apply to medical centers. In general, exposure to the medical setting in addition to chronic heart failure and its complications can exacerbate the condition. Feeling psychological pressures, including depression and anxiety, has been shown to increase an individual's heart rate and the patient's desire to continue treatment, which are among the negative consequences of hospitalization. Furthermore, depression and anxiety are the most common complications of heart disease. These complications can be life-threatening in the elderly who are hospitalized in coronary care units. The attention shown to psychological and physical health and to the psychological and physical needs of individuals reduces their dissatisfaction and problems such as depression and anxiety during their hospitalization. From past to present, individuals have been considered the customers of the health system and therefore evaluating their opinions is an important factor in improving services. Ultimately, this technique may result in faster recovery and shorter hospital stays<sup>[90]</sup>.

Chronic heart failure findings, consequences, complications, and the psychological pressures felt by individuals can affect the treatment environment. Being unwilling to comply with treatment, which can be an outcome of the treatment process, intensifies anxiety, excitement and depression, and the effects of all of these pose a danger to the heart and vascular system, and are manifested by an increased load on the heart, a rise in death rates, or a decrease in performance<sup>[87]</sup>. Hospitalization is undesirable. Cardiac health is a life-threatening factor, especially among the elderly hospitalized in cardiac care services, and anxiety and depression are the most common complications of CVDs<sup>[88]</sup>. The hospital environment is a stressor, and there is an increased incidence of anxiety and depression, which can lead to psychological reactions. There are different aspects to areas of human life, and situations such as hospitalization can lead to an individual's restlessness and a negative outcome. Conditions sometimes worsen<sup>[101]</sup> and may even manifest themselves during an individual's cardiac rehabilitation.

Depression and anxiety are prevalent and chronic among individuals with heart failure<sup>[102]</sup>. Like depression and anxiety, psychiatric morbidities are also prevalent among individuals suffering from heart failure<sup>[103]</sup>. For decades, clinicians have been aware of the incidence of anxiety and depression in patients suffering from heart problems such as heart attacks, heart failure and systemic hypertension, especially among those hospitalized in the coronary care unit<sup>[103-106]</sup>. Up until 2020, it had been estimated that ischemic heart disease and depression would be the primary and secondary factors contributing to poor health and death around the world<sup>[107]</sup>. According to a study summary of the World Health Organization (WHO), the prevalence of global anxiety and depression displayed a significant rise of 25% in the first year of the COVID-19 pandemic. Although there was improvement in this respect by the end of 2021, many people are still unable to access the care and assistance they need to deal with the psychiatric problems they lived with prior to the pandemic or with those developing afterwards<sup>[108]</sup>.

Anxiety is a natural and expected reaction towards the experience of a heart attack or living with a chronic disease. Continuous or intensive anxiety, however, is not normal and impacts individuals in various important ways<sup>[104,109-111]</sup>. It has been demonstrated that identifying and treating a psychiatric condition (anxiety or

depression) in individuals with coronary arterial disease increases survival rates and life expectancy<sup>[106]</sup>. Individuals who are being treated for depression and anxiety have been shown to be the best able to comply with plans drawn up to create an awareness of potential risks, follow a prescribed drug regimen, and abide by programs for improvement<sup>[112]</sup>.

In essence, major depressive disorder where depression is the dominating factor is a commonly diagnosed psychiatric condition affecting more than 300 million people worldwide and is associated with increased risk of coronary heart disease<sup>[113]</sup>. It has been found that the prevalence of depression among individuals with CVDs is about 15%–30%<sup>[113]</sup>, a rate that is two or three percentage points above the mean rate in any general population. Moreover, because only less than 15% of heart patients have been diagnosed and are being treated, healthcare systems are not performing at the desired level<sup>[114]</sup>. Depression can lead to poor medication compliance and the consequences of poor compliance can lead to a poor prognosis in terms of cardiovascular outcomes. Individuals known to have coronary arterial disease and a psychiatric condition should be evaluated<sup>[101]</sup>. This may increase the psychological health benefits of individuals with cardiovascular disease or who are at a risk of developing the condition<sup>[102]</sup>.

In some societies, psychological problems are stigmatized<sup>[115]</sup>. In low-income countries that include Bangladesh, the incidence of anxiety and depression is known to be minimal<sup>[116]</sup>. A worldwide study has uncovered the fact that mental health problems are rampant in Bangladesh but mental health facilities are insufficient<sup>[117]</sup>. Despite the rise of the incidence rate in Bangladesh, individuals with psychiatric conditions are not diagnosed, evaluated or treated, and CVDs still remains the primary cause of death. Unmet mental health needs may be a significant obstacle to achieving optimal management of heart disease<sup>[118–121]</sup>.

## **5. Depression and cardiovascular diseases**

Epidemiological studies evaluating the relationship between depression and CVDs consistently show a significant prospective relationship between the incidence of cardiac events and major depressive episodes<sup>[122]</sup>. Two findings are also noted in the studies. First, even if major depression does not meet the diagnostic criteria, cardiac risk increases in the presence of depressive symptoms<sup>[123]</sup>. Secondly, studies have associated the severity of depression with the risk of experiencing a cardiac condition in the future<sup>[123,124]</sup>. The effect of depression on cardiac diseases is explained by psychophysiological mechanisms including platelet activity, imbalance in hypothalamic-pituitary-adrenal axis function, abnormal autonomic nervous system function, changes in immune functions and inflammation, and biobehavioral mechanisms including risky health behaviors<sup>[122]</sup>. Loss of hope, an important symptom of depression, requires special attention. Hopelessness has been linked to sudden death in both observational and prospective studies and in animal models. In one study, the risk of CVDs was found to be twice as high in those who answered “yes” to the question, “Have you felt sad, disappointed, hopeless (in the last month)?”<sup>[123]</sup>.

## **6. Lack of social support/isolation-low socioeconomic status and cardiovascular diseases**

Social factors such as a low education level or income level, working in a low-status job, living in a poor area, poverty, lack of social and health insurance, and living alone are related to the inadequacy of support systems. Social support refers to the emotional, informational, and instrumental assistance provided by trusted individuals in the person’s social environment, such as the spouse, family, friends, and neighbors<sup>[125,126]</sup>. Social support can function as a buffer against stress and the effects of depression. It can reduce symptoms and contribute to coping with the disease and to treatment compliance. Studies have shown that people with

cardiovascular disease who receive social support have positive physical health outcomes and a reduced risk of disease<sup>[126,127]</sup>.

## Author contributions

Conceptualization, IT and AT; methodology, IT and AT; software, IT and AT; validation, IT and AT; formal analysis, IT and AT; investigation, IT and AT; resources, IT and AT; data curation, IT and AT; writing—original draft preparation, IT and AT; writing—review and editing, IT; visualization, IT and AT; supervision, IT and AT; project administration, IT and AT; funding acquisition, IT and AT. All authors have read and agreed to the published version of the manuscript.

## Conflict of interest

The authors declare no conflict of interest.

## References

1. Dağistan A, Gözüm S. Determination and management of cardiovascular disease risk on primary health care centers. *TAF Prev Med Bull* 2016;15(6): 575-582. doi: 10.5455/pmb.1-1453887275
2. Akgöz A, Gözüm S. Cardiovascular disease risk in Turkish family health centers. *J Vasc Nurs* 2019;37(2): 117-124. doi: 10.1016/j.jvn.2019.02.002
3. Topuz İ, Gözüm S. A Comparison of Actual Cardiovascular Disease Risks to the Perceptions of Middle-aged Men: A Cross-Sectional Study. *Clinical and Experimental Health Sciences* 2022;12(3): 607-617. doi: 10.33808/clinexphealthsci.984039
4. Piepoli MF, Hoes AW, Agewall S, et al. 2016 European guidelines on cardiovascular disease prevention in clinical practice: The sixth joint task force of the European Society of Cardiology and other societies on cardiovascular disease prevention in clinical practice (constituted by 91 representatives of 10 societies and by invited experts) developed with the special contribution of the European Association for Cardiovascular Prevention and Rehabilitation (EACPR). *Eur Heart J* 2016;37(29): 2315–2381. doi: 10.1093/eurheartj/ehw106
5. Eray A, Ateş E, Set T. Assessment of cardiovascular disease risk in adults. *Türk Aile Hek Derg.* 2018;22(1): 12-19. doi: 10.15511/tahd.18.00112
6. Republic of Turkey. Ministry of Health. General Directorate of Health Information Systems. *Health Statistics Yearbook, 2017.* Ankara: Kuban Publication; 2017.
7. Onat A, Can G. Prevalence of heart diseases in adults, new coronary events and the frequency of death from the heart, TEKHARF 2017 pioneer in the approach of the medical world to chronic diseases. *Türk Kardiyol Dern Arş;* 2017.
8. Topuz İ. Comparison of actual and perceived cardiovascular disease risks of men aged 40-65 living in Amasya City Center [Master's thesis]. Akdeniz University; 2019.
9. World Health Organization (WHO). Cardiovascular diseases fact sheet. Available online: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)) (accessed on 28 March 2023).
10. European Society of Cardiology (ESC). European cardiovascular disease statistics. European Heart Network. 2017. Available online: <https://www.escardio.org/TheESC/Press-Office/Fact-sheets> (accessed on 28 March 2023).
11. American Heart Association (AHA). Heart disease and stroke statistics-2019 at-a-glance. Available online: <https://www.heart.org/en/about-us/heart-and-strokeassociation-statistics> (accessed on 28 March 2023).
12. Catapano AL, Graham I, De Backer G, et al. 2016 ESC/EAS Guidelines for the Management of Dyslipidaemias. *Eur Heart J* 2016;37(39): 2999-3058. doi: 10.1093/eurheartj/ehw272
13. Bansilal S, Castellano JM, Fuster V. Global burden of CVD: focus on secondary prevention of cardiovascular disease. *Int J Cardiol* 2015;201: 1-7. doi: 10.1016/S0167-5273(15)31026-3
14. Orkaby AR, Rich MW. Cardiovascular screening and primary prevention in older adults. *Clin Geriatr Med* 2018;34(1): 81-93. doi: 10.1016/j.cger.2017.08.003
15. Topuz İ, Gözüm S. Community based on cardiovascular risk assessment. *Journal of Public Health Nursing Turkey* 2019;1 (3): 158-170.
16. Luskin F, Reitz M, Newell K, et al. A controlled pilot study of stress management training of elderly patients with congestive heart failure. *Prev Cardiol* 2002;5(4): 168-172. doi: 10.1111/j.1520.037x.2002.01029.x
17. Kelleci M, Aydın D, Sabancıoğulları S, et al. Anxiety and depression levels of in-patients according to some diagnostic groups. *Klinik Psikiyatri* 2009;12: 90-98.

18. Celano CM, Daunis DJ, Lokko HN, et al. Anxiety disorders and cardiovascular disease. *Current Psychiatry Reports* 2016;18(11): 101. doi: 10.1007/s11920-016-0739-5
19. Thombs BD, Jonge P, Coyne JC, et al. Depression screening and patient outcomes in cardiovascular care: a systematic review. *JAMA* 2008;300: 2161-2171. doi: 10.1001/jama.2008.667
20. Tan MP, Morgan K. Psychological interventions in cardiovascular disease: An update. *Curr Opin Psychiatry* 2015;28(5): 371-377. doi: 10.1097/YCO.0000000000000181
21. Albus C. Psychological and social factors in coronary heart disease. *Ann Med* 2010;42(7): 487-494. doi: 10.3109/07853890.2010.515605
22. Kocaman Yıldırım N. Art aspect of care in people with organic illness. *Turkiye Klinikleri J Psychiatr Nurs-Special Topics* 2015;1(1): 48-53.
23. Kocaman N. Consultation liaison nurse and psychosocial care in the general hospital. *Turkiye Klinikleri J Int Med Sci* 2006;2(47): 97-107.
24. Whalley B, Rees K, Davies P, et al. Psychological interventions for coronary heart disease. *Cochrane Database Syst Rev* 2011;(8): CD002902. doi: 10.1002/14651858.CD002902.pub3
25. The BACPR Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation. Available online: [http://www.bacpr.com/resources/46c\\_bacpr\\_standards\\_and\\_core\\_components\\_2012.pdf](http://www.bacpr.com/resources/46c_bacpr_standards_and_core_components_2012.pdf) (accessed on 28 March 2023).
26. Child A, Sanders J, Sigel P, et al. Meeting the psychological needs of cardiac patients: An integrated stepped-care approach within a cardiac rehabilitation setting. *Br J Cardiol* 2010;17: 175-179.
27. Norra C, Skobel EC, Arndt M, et al. High impact of depression in heart failure: Early diagnosis and treatment options. *International Journal of Cardiology* 2008;125: 220-231. doi: 10.1016/j.ijcard.2007.05.020
28. McGillion M, O'Keefe-McCarthy S, Carroll SL, et al. Impact of self-management interventions on stable angina symptoms and health-related quality of life: A meta-analysis. *BMC Cardiovasc Disord* 2014;14: 14. doi: 10.1186/1471-2261-14-14
29. Hawkes AL, Patrao TA, Atherton J, et al. Effect of a telephone-delivered coronary heart disease secondary prevention program (proactive heart) on quality of life and health behaviours: Primary outcomes of a randomised controlled trial. *Int J Behav Med* 2013;20: 413-424. doi: 10.1007/s12529-012-9250-5
30. Yousefy A, Khayyam-Nekouei Z, Sadeghi M, et al. The effect of cognitive behavioral therapy in reducing anxiety in heart disease patients. *ARYA Journal* 2006;2(2): 84-88.
31. Gellis ZD, Kenaley B. Problem-solving therapy for depression in adults: A systematic review. *Research on Social Work Practice* 2008;18: 117-131.
32. Nezu AM. Efficacy of a social problem-solving therapy approach for unipolar depression. *Journal of Consulting and Clinical Psychology* 1986;54(2): 196-202. doi: 10.1037//0022-006x.54.2.196
33. Bell AC, D'Zurilla TJ. Problem-solving therapy for depression: a meta-analysis. *Clinical Psychology Review* 2009;29: 348-353. doi: 10.1016/j.cpr.2009.02.003
34. Gellis ZD, Bruce ML. Problem-solving therapy for subthreshold depression in home healthcare patients with cardiovascular disease. *The American Journal of Geriatric Psychiatry* 2010;18(6): 464-474. doi: 10.1097/jgp.0b013e3181b21442
35. Gellis ZD, Kenaley BL, Have TT. Integrated telehealth care for chronic illness and depression in geriatric home care patients: The integrated telehealth education and activation of mood (I-TEAM) study. *Journal of the American Geriatrics Society* 2014;62(5): 889-895. doi: 10.1111/jgs.12776
36. Dixhoorna JV, White A. Relaxation therapy for rehabilitation and prevention in ischaemic heart disease: A systematic review and meta-analysis. *J Cardiovasc Prev Rehabil* 2005;12: 193-202. doi: 10.1097/00149831-200506000-00002
37. McCraty R, Tomasino D. Emotional stress, positive emotions, and psychophysiological coherence. *HeartMath Research Center Institute of HeartMath* 2006; 1-32. doi: 10.1002/3527609156.ch21
38. Allen NB, Chambers R, Knight W. Mindfulness-based psychotherapies: A review of conceptual foundations, empirical evidence and practical considerations. *Aust N Z J Psychiatry* 2006;40(4): 285-294. doi: 10.1080/j.1440-1614.2006.01794.x
39. Sullivan MJ, Wood L, Terry J, et al. The support, education, and research in chronic failure study (SEARCH): A mindfulness-based psychoeducational intervention improves depression and clinical symptoms in patients with chronic heart failure. *American Heart Journal* 2009;157(1): 84-90. doi: 10.1016/j.ahj.2008.08.033
40. Chinnaiyan KM. Role of stress management for cardiovascular disease prevention. *Current Opinion in Cardiology* 2019;34(5): 531-535. doi: 10.1097/HCO.0000000000000649
41. Kivimäki M, Steptoe A. Effects of stress on the development and progression of cardiovascular disease. *Nat Rev Cardiol* 2018;15: 215-229. doi: 10.1038/nrcardio.2017.189
42. Hatch SL, Dohrenwend BP. Distribution of traumatic and other stressful life events by race/ethnicity, gender, SES and age: A review of the research. *Am J Community Psychol* 2007;40 (3-4): 313-332. doi: 10.1007/s10464-007-9134-z

43. Sternthal MJ, Slopen N, Williams DR. Racial disparities in health: How much does stress really matter? *Du Bois Rev* 2011;8: 95–113. doi: 10.1017/S1742058X11000087
44. Smeijers L, Mostofsky E, Tofler GH, et al. Anxiety and anger immediately prior to myocardial infarction and long-term mortality: Characteristics of high-risk patients. *J Psychosom Res* 2017;93: 19–27. doi: 10.1016/j.jpsychores.2016.12.001
45. Smyth A, O'Donnell M, Lamelas P, et al. Physical activity and anger or emotional upset as triggers of acute myocardial infarction: The INTERHEART study. *Circulation* 2016; 134: 1059–1067. doi: 10.1161/CIRCULATIONAHA.116.023142
46. Mostofsky E, Penner EA, Mittleman MA. Outbursts of anger as a trigger of acute cardiovascular events: A systematic review and meta-analysis. *Eur Heart J* 2014;35: 1404–1410. doi: 10.1093/eurheartj/ehu033
47. Dimsdale JE. Psychological stress and cardiovascular disease. *J Am Coll Cardiol* 2008; 51:1237–1246. doi: 10.1016/j.jacc.2007.12.024
48. Griep RH, Nobre AA, Alves MG, et al. Job strain and unhealthy lifestyle: results from the baseline cohort study, Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). *BMC Public Health* 2015;15: 309. doi: 10.1186/s12889-015-1626-4
49. Chandola T, Britton A, Brunner E, et al. Work stress and coronary heart disease: What are the mechanisms? *Eur Heart J* 2008;29: 640–648. doi: 10.1093/eurheartj/ehm584
50. Wei J, Rooks C, Ramadan R, et al. Meta-analysis of mental stress-induced myocardial ischemia and subsequent cardiac events in patients with coronary artery disease. *Am J Cardiol* 2014;114: 187–192. doi: 10.1016/j.amjcard.2014.04.022
51. Stewart RAH, Colquhoun DM, Marschner SL, et al. Persistent psychological distress and mortality in patients with stable coronary artery disease. *Heart* 2017; 103: 1860–1866. doi: 10.1136/heartjnl-2016-311097
52. Rosengren A, Hawken S, Ounpuu S, et al. Association of psychosocial risk factors with risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): Case-control study. *Lancet* 2004;364: 953–962. doi: 10.1016/S0140-6736(04)17019-0
53. Song H, Fang F, Arnberg FK, et al. Stress related disorders and risk of cardiovascular disease: Population based, sibling controlled cohort study. *BMJ* 2019;365: 11255. doi: 10.1136/bmj.11255
54. Steinberg JS, Arshad A, Kowalski M, et al. Increased incidence of life-threatening ventricular arrhythmias in implantable defibrillator patients after the World Trade Center attack. *J Am Coll Cardiol* 2004;44: 1261–1264. doi: 10.1016/j.jacc.2004.06.032
55. Endrighi R, Dimond AJ, Waters AJ, et al. Associations of perceived stress and state anger with symptom burden and functional status in patients with heart failure. *Psychol Health* 2019; 1–17. doi: 10.1080/08870446.2019.1609676
56. Templin C, Ghadri JR, Diekmann J, et al. Clinical features and outcomes of takotsubo (Stress) cardiomyopathy. *N Engl J Med* 2015;373: 929–938. doi: 10.1056/NEJMoa1406761
57. De Hert M, Detraux J, Vancampfort D. The intriguing relationship between coronary heart disease and mental disorders. *Dialogues Clin Neurosci* 2018;20: 31–40. doi: 10.31887/DCNS.2018.20.1/mdehert
58. Ginzburg K, Solomon Z, Koifman B, et al. Trajectories of posttraumatic stress disorder following myocardial infarction: A prospective study. *J Clin Psychiatry* 2003;64: 1217–1223. doi: 10.4088/jcp.v64n1012
59. Edmondson D, Richardson S, Falzon L, et al. Posttraumatic stress disorder prevalence and risk of recurrence in acute coronary syndrome patients: A meta-analytic review. *PLoS One* 2012;7: e38915. doi: 10.1371/journal.pone.0038915
60. Shapiro PA. Heart disease. In: Levenson JL (editor). *Textbook of Psychosomatic Medicine*. The American Psychiatric Publishing; 2005. p. 423-444.
61. Özkan S. *Psychiatric Medicine: Consultation Liaison Psychiatry (Turkish)*. İstanbul: Roche A.Ş.; 1993.
62. Kocaman Yıldırım N, Öztürk S. Current psychosocial approaches in cardiovascular diseases. *Journal of Cardiovascular Nursing Turkey* 2016;7(2): 60-68. doi: 10.5543/khd.2016.81904
63. Lett HS, Blumenthal JA, Babyak MA, et al. Depression as a risk factor for coronary artery disease: Evidence, mechanisms and treatment. *Psychosom Med* 2004;66: 305-315. doi: 10.1097/01.psy.0000126207.43307.c0
64. Lespe'rance F, Frasure-Smith N, Koszycki D, et al. Effects of citalopram and interpersonal psychotherapy on depression in patients with coronary artery disease. The Canadian Cardiac Randomized Evaluation of Antidepressant and Psychotherapy Efficacy (CREATE) Trial. *J Am Med Assoc* 2007;297: 367–379.
65. Lichtman JH, Bigger JT, Blumenthal JA, et al. Depression and coronary heart disease: Recommendations for screening, referral and treatment: A science advisory from the American Heart Association Prevention Committee of the Council on Cardiovascular Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention and Interdisciplinary Council on Quality of Care and Outcomes Research: Endorsed by the American Psychiatric Association. *Circulation* 2008;118: 1768-1775. doi: 10.1161/CIRCULATIONAHA.108.19 0769

66. Lichtman JH, Froelicher ES, Blumenthal JA, et al. Depression as a risk factor for poor prognosis among patients with acute coronary syndrome: Systematic review and recommendations: A scientific statement from the American Heart Association. *Circulation* 2014;129: 1350-1369. doi: 10.1161/CIR.0000000000000019
67. Albus C, Jordan J, Lingen CH. Screening for psychosocial risk factors in patients with coronary heart disease—recommendations for clinical practice. *European Journal of Cardiovascular Prevention and Rehabilitation* 2004;11: 75-79. doi: 10.1097/01.hjr.0000116823.84388.6c
68. Grace SL, Abbey SE, Irvine J, et al. Prospective examination of anxiety persistence and its relationship to cardiac symptoms and recurrent cardiac events. *Psychother Psychosom* 2004;73(6): 344–352. doi: 10.1159/000080387
69. Hanssen TA, Nordrehaug JE, Eide GE, et al. Anxiety and depression after acute myocardial infarction: An 18-month follow-up study with repeated measures and comparison with a reference population. *Eur J Cardiovasc Prev Rehabil* 2009;16(6): 651–659. doi: 10.1097/HJR.0b013e32832e4206
70. Koivula M, Tarkka MT, Tarkka M, et al. Fear and anxiety in patients at different time-points in the coronary artery bypass process. *Int J Nurs Stud* 2002;39(8): 811–822. doi: S0020748902000226
71. Easton K, Coventry P, Lovell K, et al. Prevalence and measurement of anxiety in samples of patients with heart failure: Meta-analysis. *J Cardiovasc Nurs* 2016;31(4): 367-379. doi: 10.1097/JCN.0000000000000265
72. Brouwers C, Denollet J, Caliskan K, et al. Psychological distress in patients with a left ventricular assist device and their partners: An exploratory study. *Eur J Cardiovasc Nurs* 2015;14(1): 53–62. doi: 10.1177/1474515113517607 1474515113517607
73. Modica M, Ferratini M, Torri A, et al. Quality of life and emotional distress early after left ventricular assist device implant: A mixed-method study. *Artif Organs* 2015;39(3): 220–227. doi: 10.1111/aor.12362
74. Magyar-Russell G, Thombs BD, Cai JX, et al. The prevalence of anxiety and depression in adults with implantable cardioverter defibrillators: A systematic review. *J Psychosom Res* 2011;71(4): 223–231. doi: 10.1016/j.jpsychores.2011.02.014 S0022-3999(11)00088-2
75. Roest AM, Martens EJ, de Jonge P, et al. Anxiety and risk of incident coronary heart disease: A meta-analysis. *J Am Coll Cardiol* 2010;56(1): 38–46. doi: 10.1016/j.jacc.2010.03.034
76. Celano CM, Millstein RA, Bedoya CA, et al. Association between anxiety and mortality in patients with coronary artery disease: A meta-analysis. *Am Heart J* 2015;170: 1105–1115. doi: 10.1016/j.ahj.2015.09.013
77. Friedmann E, Thomas SA, Liu F, et al. Relationship of depression, anxiety, and social isolation to chronic heart failure outpatient mortality. *Am Heart J* 2006;152(5): 940. doi: 10.1016/j.ahj.2006.05.009
78. Jiang W, Kuchibhatla M, Cuffe MS, et al. Prognostic value of anxiety and depression in patients with chronic heart failure. *Circulation* 2004;110(22): 3452-3456. doi: 10.1161/01.cir.0000148138.25157.f9
79. Konstam V, Salem D, Pouleur H, et al. SOLVD Investigations. Studies of Left Ventricular Dysfunction Investigators Baseline quality of life as a predictor of mortality and hospitalization in 5,025 patients with congestive heart failure. *Am J Cardiol* 1996;78(8): 890–895. doi: S0002914996004638
80. Pelle AJ, Pedersen SS, Schiffer AA, et al. Psychological distress and mortality in systolic heart failure. *Circ Heart Fail* 2010;3(2): 261–267. doi: 10.1161/circheartfailure.109.871483
81. Al-Ani M, Winchester DE. Prevalence and overlap of noncardiac conditions in the evaluation of low-risk acute chest pain patients. *Crit Pathw Cardiol* 2015;14(3): 97–102. doi: 10.1097/HPC.000000000000050 00132577-201509000-00003
82. Fleet RP, Dupuis G, Marchand A, et al. Panic disorder in emergency department chest pain patients: Prevalence, comorbidity, suicidal ideation, and physician recognition. *Am J Med* 1996;101(4): 371–380. doi: S0002-9343(96)00224-0
83. Ortiz-Garrido O, Ortiz-Olvera NX, Gonzalez-Martinez M, et al. Clinical assessment and health-related quality of life in patients with non-cardiac chest pain. *Rev Gastroenterol Mex* 2015;80(2): 121–129. doi: 10.1016/j.rgmex.2015.03.005 S0375-0906(15)00054-3
84. Hutter AM Jr, Amsterdam EA, Jaffe AS. 31st Bethesda Conference. Emergency Cardiac Care. Task force 2: Acute coronary syndromes: Section 2B--Chest discomfort evaluation in the hospital. *J Am Coll Cardiol* 2000;35(4): 853–862.
85. Banaei A, Hashemi B, Bakhshandeh M, et al. Evaluation of various common prostate IMRT techniques based on estimated tumor control and normal tissue complication probabilities in correlation with patients' anatomical parameters derived from the CT scans. *Pol J Med Phys Eng* 2019;25(1): 35–41. doi: 10.2478/pjmpe-2019-0006
86. Karaca A, Durna Z. Patient satisfaction with the quality of nursing care. *Nurs Open* 2019;6(2): 535–545. doi: 10.1002/nop2.237
87. Polikandrioti M, Koutelekos I, Vasilopoulos G, et al. Anxiety and depression in patients with permanent atrial fibrillation: Prevalence and associated factors. *Cardiol Res Pract* 2018;2018: 7408129. doi: 10.1155/2018/7408129
88. Khan SA, Azhar S, Asad SM, et al. Assessment of anxiety and depression in hospitalized cardiac patients of Faisalabad Institute of Cardiology, Pakistan. *Trop J Pharm Res* 2016;15(11): 2483–2488. doi: 10.4314/tjpr.v15i11.25

89. Ebadi A, Moradian ST, Feyzi F, et al. Comparison of hospital anxiety and depression among patients with coronary artery disease based on proposed treatment. *Iran J Crit Care Nurs* 2011;4(2): 97-102.
90. Farokhnezhad Afshar P, Bastani F, Haghani H, et al. Hospital anxiety and depression in the elderly with chronic heart failure. *Iran Journal of Nursing* 2019;32(120):87–97. doi: 10.29252/ijn.32.120.87
91. Alavi M, Farokhnezhad-Afshar P, Daneshvar-Dehnavi S. The effect of Lavender essence on stress in intensive care unit (ICU) nurses. *Iranian Journal of Cardiovascular Nursing* 2015;4(1): 6-12.
92. Bastani F, Farokhnezhad Afshar P, Valipour O. Evaluating the relationship between nursing care quality and hospital anxiety and depression among old patients with cardiovascular disease. *Journal of Caring Sciences* 2022;11(2): 71–75. doi: 10.34172/jcs.2022.12
93. Kazitani BS, Furuya RK, Dantas RA, et al. Preoperative anxiety and depression: Differences among patients submitted to the first cardiac surgery. *Rev Rene* 2018;19: e3079. doi: 10.15253/2175-6783.2018193079
94. Orujlu S, Hemmati-Maslakpak M. Effect of nursing interventions on anxiety and vital signs in patients undergoing endoscopy: a randomized clinical trial study. *J Clin Nurs Midwifery* 2014;3(3): 36-43.
95. Maddock A, Kralik D, Smith J. Clinical governance improvement initiatives in community nursing. *Clin Gov* 2006;11(3): 198–212. doi: 10.1108/14777270610683137
96. Carbon C. Continuing professional development and clinical governance: The role of scientific societies. *Clin Microbiol Infect* 2005;11 Suppl 1: 24–27. doi: 10.1111/j.1469-0691.2005.01086.x
97. Kaviani H, Seyfourian H, Sharifi V, et al. Reliability and validity of anxiety and depression hospital scales (HADS): Iranian patients with anxiety and depression disorders. *Tehran Univ Med Sci* 2009;67(5): 379-385.
98. Abolhasani F, Bastani F. Successful ageing in the dimensions of life satisfaction and perception of ageing in the Iranian elderly adults referring to the health center in the west of Tehran, Iran. *Iran Journal of Nursing* 2019;31(116): 61–74. doi: 10.29252/ijn.31.116.61
99. Avia I, Hariyati RT. Impact of hospital accreditation on quality of care: A literature review. *Enferm Clin* 2019;29 Suppl 2: 315–320. doi: 10.1016/j.enfcli.2019.06.003
100. Azimbeik Z, Jafarjalal E, Bastani F, et al. A survey of the workability level of nurses in the selected educational-medical centers of Tehran University of Medical Sciences. *Iran J Nurs Res* 2017;12(5): 9–13. doi: 10.21859/ijnr-12052
101. Sharma Dhital P, Sharma K, Poudel P, et al. Anxiety and depression among patients with coronary artery disease attending at a cardiac center, Kathmandu, Nepal. *Nursing Research and Practice* 2018;2018: 4181952. doi: 10.1155/2018/4181952
102. Amin MA, Ahmed M, Nahin S, et al. Assessment of depression and anxiety among admitted people with heart disease conditions: A cross-sectional hospital-based study in a Bangladeshi population during the COVID-19. *Frontiers in Psychiatry* 2022;13: 895224. doi: 10.3389/fpsy.2022.895224
103. Ryder AL, Cohen BE. Evidence for depression and anxiety as risk factors for heart disease and stroke: Implications for primary care. Oxford: Oxford University Press; 2021. pp. 365–367.
104. Sciagrà R, Martini AL, Allocca M. The brain connection between stress and heart: A convincing research opportunity to reduce risk and gender disparity in cardiovascular disease. Berlin: Springer; 2021. pp. 433–435.
105. Shibata T, Mawatari K, Nakashima N, et al. Multidisciplinary team-based palliative care for heart failure and food intake at the end of life. *Nutrients* 2021;13: 2387. doi: 10.3390/nu13072387
106. So H, Tam LS. Cardiovascular disease and depression in psoriatic arthritis: Multidimensional comorbidities requiring multidisciplinary management. *Best Pract Res Clin Rheumatol* 2021;35: 101689. doi: 10.1016/j.berh.2021.101689
107. World Health Organization (WHO). The global burden of disease- a comprehensive assessment of mortality disability from diseases injuries risk factors in 1990 projected to 2020 World Health Organization. Available online: [https://apps.who.int/iris/bitstream/handle/10665/41864/0965546608\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/41864/0965546608_eng.pdf) (accessed on 28 March 2023).
108. World Health Organization. (WHO). COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide 2022. Available online: <https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide> (accessed on 28 March 2023).
109. Azeez AM, Puri GD, Samra T, et al. Effect of short-term yoga-based-breathing on peri-operative anxiety in patients undergoing cardiac surgery. *Int J Yoga* 2021;14: 163. doi: 10.4103/ijoy.IJOY\_120\_20
110. Lai M, Shen T, Cui H, et al. Clinical outcomes and survival analysis in patients with psycho-cardiological disease: A retrospective analysis of 132 cases. *J Int Med Res* 2021;49: 0300060521990984. doi: 10.1177/0300060521990984
111. Levine GN, Cohen BE, Commodore-Mensah Y, et al. Psychological health, well-being, and the mind-heart-body connection: A scientific statement from the American Heart Association. *Circulation* 2021;143: e763–e83. doi: 10.1161/CIR.0000000000000947
112. Partovi LH, Anboohi SZ, Farahani ZB, et al. Comparison of acute coronary syndrome patients with anxiety regarding comorbidity diseases, history of hospitalization, type of disease and treatment in coronary care unit. *J Prev Epidemiol* 2018;3: e07.

113. Allabadi H, Alkaiyat A, Alkhayyat A, et al. Depression and anxiety symptoms in cardiac patients: A cross-sectional hospital-based study in a Palestinian population. *BMC Public Health* 2019;19: 1–14. doi: 10.1186/s12889-019-6561-3
114. Huffman JC, Smith FA, Blais MA, et al. Recognition and treatment of depression and anxiety in patients with acute myocardial infarction. *Am J Cardiol* 2006;98: 319–324. doi: 10.1016/j.amjcard.2006.02.033
115. Rathod S, Pinninti N, Irfan M, et al. Mental health service provision in low-and middle-income countries. *Health Serv Insights* 2017;10: 1178632917694350. doi: 10.1177/1178632917694350
116. Ormel J, Von Korff M, Burger H, et al. Mental disorders among persons with heart disease-results from World Mental Health surveys. *Gen Hosp Psychiatry* 2007;29: 325–334. doi: 10.1016/j.genhosppsych.2007.03.009
117. World Health Organization (WHO). WHO-AIMS Report on Mental Health System in Bangladesh. Geneva: WHO; 2007.
118. Amin MN. Global burden of non-communicable diseases: Preparedness of Bangladesh to combat the menace. *Ibrahim Card Med J* 2018;8: 5–9. doi: 10.3329/icmj.v8i1-2.53969
119. Islam AM, Mohibullah A, Paul T. Cardiovascular disease in Bangladesh: A review. *Bangladesh Heart J* 2016;31: 80–99. doi: 10.3329/bhj.v31i2.32379
120. Mirelman A, Koehlmoos TP, Niessen L. Risk-attributable burden of chronic diseases and cost of prevention in Bangladesh. *Glob Heart* 2012;7: 10. doi: 10.1016/j.gheart.2012.01.006
121. Sultana M, Mahumud RA, Sarker AR. Burden of chronic illness and associated disabilities in Bangladesh: Evidence from the household income and expenditure survey. *Chronic Dis Transl Med* 2017;3: 112–22. doi: 10.1016/j.cdtm.2017.02.001
122. Freedland KE, Carney RM. Depression as a risk factor for adverse outcomes in coronary heart disease. *BMC Medicine* 2013;11: 131. doi: 10.1186/1741-7015-11-131
123. Anda R, Williamson D, Jones D, et al. Depressed affect, hopelessness, and the risk of ischemic heart disease in a cohort of U. S. adults. *Epidemiology*. 1993;4: 285–94. doi: 10.1097/00001648-199307000-00003
124. Everson SA, Goldberg DE, Kaplan GA, et al. Hopelessness and risk of mortality and incidence of myocardial infarction and cancer. *Psychosom Med*. 1996;58: 113–21. doi: 10.1097/00006842-199603000-00003
125. Khayyam-Nekouei Z, Neshatdoost H, Yousefy A, Sadeghi M, Manshaee G. Psychological factors and coronary heart disease. *ARYA Atheroscler* 2013;9(1): 102-11.
126. Uysal H. Psychosocial approach in rehabilitation of cardiac patients (Turkish). *Türkiye Klinikleri J Nurs Sci* 2016;8(3): 257-70. doi: 10.5336/nurses.2015-47453
127. Arthur HM. Depression, isolation, social support, and cardiovascular disease in older adults. *J Cardiovasc Nurs* 2006;21: 2-7. doi: 10.1097/00005082-200609001-00002