



# Effect of Spiritual Care on Post-traumatic Stress Disorder in Women With Acute Myocardial Infarction

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## Abstract

**Objectives:** Patients with acute myocardial infarction (AMI) are at risk for post-traumatic stress disorder (PTSD). The prevalence and severity of PTSD in women is higher than in men. This study aimed to investigate the effect of spiritual care on PTSD in women with AMI.

**Materials and Methods:** This was a clinical trial with the control group, in which 80 female patients who were admitted to the CCU due to AMI were enrolled using purposive sampling, and were randomly assigned to intervention (n = 40, spiritual care) and control (n = 40, routine care) groups by blocking methods. Spiritual care was provided to the patients during the first three days of admission. Data collection was conducted by a demographic questionnaire (at the beginning of the study) and a PTSD checklist (PCL, one month after AMI).

**Results:** Patients in the two groups were similar in terms of demographic and basic characteristics. The results showed that one month after admission, the mean PCL scores in the control ( $50.4 \pm 7.1$ ) group, were significantly more than the intervention ( $42.4 \pm 6.6$ ) group ( $P = 0.000$ ). Also, the frequency of PTSD in the control group (26 or 65%) was remarkably higher than in the intervention (7 or 17.5%) group ( $P = 0.000$ ). In other words, the incidence of PTSD (after a month) in the spiritual care group was notably lower than in the control group.

**Conclusions:** Providing spiritual care by nurses in the CCU can reduce PTSD in patients with AMI.

**Keywords:** Acute myocardial infarction, Coronary care unit, Post traumatic stress disorder, Spiritual care

## Introduction

Cardiovascular diseases are the first and most common cause of mortality and disability in societies and are the reason for roughly one-third of deaths in the world (1). Their prevalence is increasing both in developing and in developed countries (2,3). Moreover, they account for approximately 46% of all deaths in Iran (4) and it is estimated that more than 300 death per day in Iran is due to myocardial infarction (5). Among all heart diseases, ischemic heart disease, especially acute coronary syndrome, is the most common disease that can lead to heart attacks, angina, and even sudden cardiac death (6).

The results of different studies have shown that in addition to traumas that stem from natural disasters (e.g. earthquakes, floods, etc) and man-made disasters (e.g. accidents, wars, etc.), life-threatening diseases such as heart attack can cause psychological problems as well as post-traumatic stress disorder (PTSD) (7,8). Depression and anxiety symptoms are common in these patients due to the changes that occur in the ongoing course of their lives after a heart attack (7). Since a heart attack is of a sudden and unexpected event, it can lead to psychological problems. In other words, myocardial infarction is a

traumatic event (7,9), and some studies have shown that one eighth of patients with a heart attack develops PTSD, which itself can increase the risk of the next stroke (5). After a heart attack, 0% to 22% of the patients are affected by PTSD and are 3 times more at risk of PTSD than normal people. These patients are also more prone to depression and anxiety (10).

PTSD is a long-lasting condition of emotional stress that is caused by trauma or severe psychological shock. This state, mainly as a sleep disorder, is a frequent reminder of the traumatic experience and ultimately results in isolation from others as well as the outside world (8,11). The incidence of this disorder in different accidents shows various patterns, such that its rate in violence-related injury (such as motor vehicle crashes, homicide, domestic and school violence, etc.) at one month post-injury ranged between 11%–60.9% (12).

PTSD can interfere with normal life and can hinder daily chores (13). Furthermore, anxiety disorders, depression, and PTSD have been identified as risk factors for atherosclerosis and coronary artery disease and can exacerbate coronary artery disease. There is a meaningful relationship between myocardial infarction and PTSD.

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## Key Messages

- ▶ PTSD as an independent risk factor can increase mortality and complications of acute myocardial infarction.
- ▶ Spiritual care can reduce the occurrence of PTSD in women with myocardial infarction

Stressful situations can increase the risk of atherosclerosis, the most important cause of myocardial infarction, by stimulating sympathetic adrenal, nervous stimulation, and platelet aggregation (8,14). Moreover, the onset of PTSD can reduce patients' compliance with their drug prescriptions and undermine the clinical outcome of coronary artery disease. In addition, PTSD can increase the incidence of serious cardiovascular events (such as hospitalization due to myocardial infarction, angina pectoris, coronary artery bypass graft, or angioplasty) and mortality (11). Many studies have been conducted on the differences between women and men regarding the risk of coronary artery disease, risk factors, clinical symptoms, mortality, impotency due to myocardial infarction, and prevalence, as well as the severity of PTSD. Approximately 90% of people experience at least one traumatic event during their lifetime; however, the prevalence of PTSD in life is only 5-6% in men and 12-14% in women (15). An important point in this aspect is that despite higher exposure of men to traumatic factors, the rate of PTSD in women (16) is almost twice higher than in men (15). Thus, some believe that women are intrinsically more vulnerable (17). In order to confirm this, in a meta-analysis Tolin and Foa stated that among all traumatizing factors and considering the similarity of traumatic events, women are more susceptible to develop PTSD than men (18). In a similar study, Dobie et al stated that the incidence of PTSD in women is twice that of men (19). Studies have also shown that the duration of PTSD in women and men is 5 and 2 years, respectively (19,20); hence, it is important to pay attention to it.

Different treatment methods for PTSD have been identified. Psychotherapy and drug therapy are among the strategies for the treatment of PTSD (5). The standard treatment of PTSD is psychiatric counseling, like cognitive-behavioral therapy (CBT), and selective serotonin reuptake inhibitors (SSRIs) (16). Since the used drugs can have adverse effects on the patient heart and exacerbate his condition (such as increased blood pressure, risk of dysrhythmia, and the possibility of another stroke) (5) the use of non-drug methods such as religious-spiritual care can be helpful. Several studies have shown the relationship between spirituality and religious beliefs with mental health and adaptability, such that these individuals usually have less anxiety, depression, and psychological damage (17). A study of 309 cardiac patients in Michigan showed that those who use religious confrontation are less likely to develop depression and anxiety and recover faster (18). Many studies have shown that spirituality is related

to mental and physical health. This relation involves decreased mortality, reduced cardiovascular disease and blood pressure issues, less substance abuse, and improved recovery from illnesses (13). Also, spiritual care has been able to reduce the anxiety and stress of patients' families admitted to the CCU and increase their compliance and satisfaction (21). Religious affiliation is positively associated with mental health, and religious people have less psychological distress and more satisfaction with life (22).

In addition to the higher occurrence of PTSD in women than in men, the results of studies have shown that comfort and psychosocial compatibility following myocardial infarction are significantly different in women and men, namely, women experience lower life quality, they have difficulty in getting along with the disease, and they are more likely to be anxious, depressed and suffer from sleep disorders (23). However, according to Francis, women throughout life are more religious than men (24), but unfortunately, their mental health is not better than men (25). McFarland also showed that the higher the religious beliefs in older men, the lower their depression, while women are not similar (26). Therefore, showing the effect of spiritual care on the incidence of PTSD in women after acute myocardial infarction (AMI) is important. Bormann believes that despite the evidence that spirituality and religion can be considered one of the sources of compatibility in many people, little spiritual intervention has taken place on PTSD (27). Since no study has been carried out on the effect of spiritual care on PTSD in women with AMI, this study aimed to investigate the effect of spiritual care on the incidence of PTSD in women with AMI, who were hospitalized in the CCU.

## Materials and Methods

This one-way blind clinical trial was conducted in 2018 on patients with AMI who were admitted to the CCU of Amir Kabir Hospital in Arak. To determine the sample size, based on a similar analysis in Momeni Ghale Ghasemi et al study (13), using  $n \geq \frac{(z_{\alpha/2} + z_{\beta})^2 \sigma^2 (1 + 1/k)}{\epsilon^2}$ , taking into account the probability of the first-type error  $\alpha = 0.05 \Rightarrow z_{\alpha} = 1.96$ , the test power  $1 - \beta = 0.80 \Rightarrow z_{\beta} = 0.84$ , the effect size  $\theta = |\epsilon|/\sigma = 0.65$ , and taking into consideration the probability of falling, 40 subjects were included for each group. Therefore, 80 female AMI patients who met inclusion criteria entered the study and were divided into the intervention group (40 subjects) and control group (40 subjects) with randomized allocation using a block approach.

The inclusion criteria were diagnosis of AMI by a cardiologist, femininity, alertness, being a Farsi speaker, being Muslim, having no known psychological illness and not taking psychotherapy drugs, not being mentally retarded, not having epilepsy, and full awareness of time, place, and identity. Also, the exclusion criteria were unwillingness to continue the study, having a second

myocardial infarction or any severe and dangerous side effects such as severe heart failure, need for pacemakers and implantable shock devices, need for angiography, angioplasty, and coronary artery bypass graft surgery, passing away or changing the patient's place of residence, and confronting any crisis during the study.

In this study, a spiritual care protocol was developed and employed based on the needs assessment of patients with AMI (Table 1). To develop a spiritual care protocol, the researcher identified their spiritual care needs through structured interviews and spiritual needs questionnaire with 10 patients suffering from AMI, who were admitted to the CCU. Then, the researcher developed a spiritual care protocol based on the Islamic approach with the help of a spiritual counselor to meet the patients' needs. The content of the spiritual care protocol, designed to increase spiritual hopefulness, includes a content-based intervention that addresses the three main axes, including concern about the future, self-esteem, and feelings of guilt, to change the attitude of the patients. Spiritual care consisted of three half-hour sessions that were done individually on a daily basis (in the first three days of admission), during the work shift of the evening (between 7:00-9:00) alongside the patient's bed. For patients in the control group, the usual care was performed.

Two questionnaires were used to collect information. The demographic and basic information questionnaires were completed at the beginning of the study and included age, education, per capita income, marital status, occupation, high blood pressure, blood lipids, diabetes, and smoking. A PTSD assessment checklist (PCL) was completed to determine the PTSD score and statistical frequency of subjects with PTSD one month later by calling the patient a person who was unaware of the control and intervention groups. This list was a self-reporting 17-point scale, used to assess the extent of PTSD. This tool was provided by

Weather et al, based on the DSM diagnostic criteria Center in the United States. Five questions were related to signs and symptoms of re-experiencing a traumatic event, 7 items were related to signs and symptoms of impulsivity and avoidance, and 5 were related to signs and symptoms of severe arousal (28). The list was computed in Iran by Goodarzi et al (29) at Shiraz University using the data obtained from implementing the list on 117 samples with Cronbach's alpha coefficient calculated for the reliability of 0.93. Also, the validity coefficient of this list was 0.87 based on the bisection method and the individuality of the questions. Scores in the questionnaire were such that the options: "not at all, very low, average, high, and very high," scored 1 to 5, respectively. The total score of the questionnaire was (in the range of 17-85, with a cut point of 50).

The data collected by the questionnaires were entered in SPSS version 16. For analysis, descriptive statistics and computing central indicators and dispersion were used. Regarding the nature of data and their distribution, the chi-square test, Fisher's exact test, independent t-test, and non-parametric Mann-Whitney U test were utilized.

## Results

This study was conducted from August to November 2018 in the CCU of the Amir Kabir hospital in Arak. Out of the 100 cases that were included in the study, 20 were excluded: 7 cases due to lack of cooperation and not answering the calls, 6 cases due to angioplasty and coronary artery bypass grafting, 3 cases because of death, 2 cases due to severe complications such as severe heart failure and need for a pacemaker, and 2 cases due to heart attack. Therefore, 80 patients completed the study.

Comparison between the two groups in terms of demographic and basic information is presented in Table 2, which shows that there was no difference between the

**Table 1.** Pattern of Spiritual Care

Session	Subject	Content
1st	Familiarity with the patient and expression of confidence	Introducing yourself to the patients, hearing their questions and concerns about their illness, their being away from family and relatives, life, etc. Talking about the illness, diagnostic and therapeutic methods, the course of therapy and self-care to eliminate physical and emotional concerns Effective use of non-verbal communication methods The expression of the concept of trust, the reliance on the will of God, the constant presence and protection of God at all stages, and His ability to help Establishing a positive attitude and increasing inner peace
2nd	Stating the significance of illness and improving self-esteem	Strengthening patients' capabilities against disease-related constraints Emphasizing patients' strengths, defining new roles, and enhancing the sense of value Helping patients' autonomy in doing personal and routine chores by themselves Strengthening the sense of bondage and closeness to the Almighty God Encouraging the patient to perform religious practices and praying
3rd	Relaxation and strengthening spirituality	Explaining the material causes of the disease and relieving the patients' concern about the consequences of past sins Repentance, returning to God and getting closer to Him Paying attention to God's mercy and his endless forgiveness Reading Quran and praying and repeating and paying attention to its content by the patient Increasing hope and emotional support with assistance from patients' companions

two groups regarding age, education level, per capita income, marital status, occupation, lipid profile, diabetes mellitus, and smoking; hence, the two groups were the same.

The mean and standard deviation of PTSD in the intervention group were  $42.6 \pm 6.6$ , lower than in the control group  $50.4 \pm 7.1$  (Table 3). In other words, the PTSD score in the spiritual care group was significantly lower than in the control group after a month. Considering the quantitative nature of data and their non-normalized distribution, the non-parametric Mann-Whitney U test was used to compare the two groups. The frequency of patients with PTSD in the intervention group was 7 or 17.5%, while in the control group was 26 or 65% (Table 4). Thus, the incidence of PTSD after a month in the spiritual care group was meaningfully lower than in the control group (concerning the qualitative nature of data, the chi-square test was utilized to compare the two groups).

### Discussion

This study aimed to investigate the effect of spiritual care on the incidence of PTSD in AMI women who were admitted to the CCU. A comparison of the patients in the intervention and control groups showed that there was no difference between them in terms of demographic and basic information, and the two groups were almost identical at the beginning of the study. The most important finding of the present study is that one month after intervention, the mean, and standard deviation of PTSD scores were significantly lower in the intervention group than in the control group. Also, the frequency of patients with PTSD in the intervention group was lower than the control group in a way the difference was statistically meaningful. In other words, spiritual care has prevented the occurrence of PTSD.

As far as researchers know, this is the first study on the effect of spiritual care on preventing the onset of PTSD in women with AMI. Several studies have investigated the effect of spiritual care on anxiety and depression in patients with AMI. The study conducted by Tajbakhsh et al examined the impact of religious-spiritual care on anxiety levels in 68 patients who underwent coronary artery bypass graft surgery at Baqiyatallah Al-Azam hospital. The results of the study revealed a significant decrease in anxiety levels following the intervention (30).

The effect of poetry therapy (reading poetry), which is an art therapy method, was investigated on PTSD patients with myocardial infarction in Bushehr in 2015. In this study, four 45-minute poetry sessions were conducted at the time of hospitalization of the patient in the CCU, and similar to the present study, PCL was used to assess PTSD. The results indicated that the score of PTSD after the intervention was significantly lower in the intervention group than in the control group. Also, the mean PTSD score of the intervention group significantly decreased after the intervention, while the change in PTSD score of

**Table 2.** Frequency Distribution of Subjects Under Study Based on Demographic and Basic Characteristics in Intervention and Control Groups

Demographic Situation	Intervention Group No. (%)	Control Group No. (%)	P Value
Age (Mean $\pm$ SD)	63.9 (10.4)	64.5 (11.5)	0.7
Education			
Under the diploma	29 (72.5)	32 (80)	0.07
Diploma	11 (27.5)	5 (12.5)	
Academic	0 (0)	3 (7.5)	
Income			
<15 million IRR	13 (32.5)	16 (40)	0.4
>15 million IRR	27 (67.5)	24 (60)	
Marital status			
Married	40 (100)	40 (100)	1.0
Occupation			
Housewife	31 (77.5)	29 (72.5)	0.5
Employee	8 (20)	7 (17.5)	
Free	1 (2.5)	4 (10)	
Hypertension			
Does have	31 (77.5)	32 (80)	0.7
Does not have	9 (22.5)	8 (20)	
Blood lipids			
Does have	25 (62.5)	19 (47.5)	0.1
Does not have	15 (37.5)	21 (52.5)	
Does not have	9 (22.5)	19 (47.5)	
Diabetes			
Does have	17 (42.5)	18 (45)	0.8
Does not have	23 (57.5)	22 (55)	
Tobacco use			
Does have	0 (0)	4 (10)	0.1
Does not have	40 (100)	36 (90)	

**Table 3.** Comparison of Mean PTSD Score in the Intervention and Control Groups

Intervention Group Mean $\pm$ SD	Control Group Mean $\pm$ SD	P Value
50.4 $\pm$ 7.1	42.6 $\pm$ 6.6	0.000

**Table 4.** Comparison of the Frequency Distribution of Patients With PTSD in the Intervention and Control Groups

Having PTSD	Intervention Group No. (%)	Control Group No. (%)	P Value
Does have	7 (17.5)	26 (65)	0.000
Does not have	33 (82.5)	14 (35)	

the control group was not significant (31). The results of these studies are in consistent with the present study.

Groleau et al concluded that the experience of a heart attack can be a serious injury to many patients and their families and may lead to negative psychosocial responses such as fear, anxiety, depression, and PTSD. Meanwhile, some scholars believe that responding to life-threatening events does not necessarily have a negative side effect and can lead to positive changes that may improve a patient's recovery and adaptation to stress. In some patients, stress



may also increase spirituality and religiousness, which is associated with increasing the patient's success in adapting to stress (2). The present study aimed to reduce the negative aspects of this stress and strengthen its positive points by strengthening spirituality as one of the factors influencing the adaptation of individuals to different situations. Unfortunately, after a heart attack, attention is only paid to biomedical care, such as reducing risk factors or reducing the likelihood of a recurrent stroke; whereas the results of Groleau and colleagues' study showed these patients are faced with a complex set of meanings and arguments that contain social, moral, and spiritual concepts as well as changes in personal values and identity. Therefore, to respond to these changes, which are effective in adapting to the disease, healthcare professionals should be involved, talking to the patients about their opinions of the causes of their disease, its impact on their identity, the consequences of facing death, their relationship with their family, and their spirituality. He emphasizes that paying attention to spirituality is important in the patient's adaptation to the disease, comfort, and identifying the patient's personal and social concerns (2).

Unfortunately, few clinical trials have been conducted on the treatment of PTSD after myocardial infarction. In a review study, Vilchinsky stated that despite numerous studies of post-stroke PTSD, and some evidence of its negative consequences, few interventions have been conducted in this regard which are mostly case reports. He further stated that only two studies have examined the effect of CBT and had a modest effect on the treatment of PTSD after myocardial infarction (6). Therefore, the use of spiritual interventions to prevent PTSD can play an important role in reducing the complications and risks in patients with myocardial infarction.

### Limitations of the study

One of the limitations of this study was conducting it only in one center, and since patients who were admitted to the center may be socially and culturally different from other patients, it will be restricted to generalize the results. Furthermore, the diagnosis of PTSD was performed through questionnaires and phone calls, which do not have sufficient sensitivity to detect PTSD. Another limitation of this study was that spiritual care was taken by one person and only at certain times, while spiritual care, like other care, may be more effective when it is carried out continuously and by the entire care team. This requires to be considered in subsequent similar studies.

### Conclusions

The results of the present study showed that the prevalence of PTSD in women after an acute heart attack is more common than the statistics in the studies that have been conducted so far. Considering that this complication is associated with many physical and mental-psychological consequences and often remains unknown and is not

paid attention to until the patient has experienced severe and debilitating symptoms, therefore the implementation of spiritual care in time Admitting these patients to the cardiac special care unit can play an important role in preventing it. So Providing spiritual care by nurses in the CCU can reduce PTSD in patients with AMI.

### Authors' Contribution

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**Funding Acquisition:** All authors.

### Conflict of Interests

Authors have no conflict of interest.

### Ethical Issues

This study was approved by the Research Council and the Ethics Committee of Arak University of Medical Sciences under No. 1397.156. In addition, it was registered at the Iranian Center for Clinical Trials (identifier: IRCT20180903040935N1; <https://irct.ir/trial/34945>). It was assured to patients that all information would only be used for research purposes and would remain confidential. They were provided with enough information about the goals and methods of doing this research and written consent was received from them. They had the right to be excluded at any time, without any change in their treatment. The researchers committed themselves to comply with the ethical principles provided by the Ministry of Health and Medical Education at all stages of the investigation.

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### References

1. Deaton C, Froelicher ES, Wu LH, Ho C, Shishani K, Jaarsma T. The global burden of cardiovascular disease. *Eur J Cardiovasc Nurs*. 2011;10 Suppl 2:S5-13. doi:10.1016/s1474-5151(11)00111-3
2. Groleau D, Whitley R, Lespérance F, Kirmayer LJ. Spiritual reconfigurations of self after a myocardial infarction: influence of culture and place. *Health Place*. 2010;16(5):853-860.

- doi:10.1016/j.healthplace.2010.04.010
3. Saadat S, Yousefifard M, Asady H, Moghadas Jafari A, Fayaz M, Hosseini M. The most important causes of death in Iranian population; a retrospective cohort study. *Emerg (Tehran)*. 2015;3(1):16-21.
  4. Fahimfar N, Khalili D, Ghajarieh Sepanlou S, et al. Cardiovascular mortality in a Western Asian country: results from the Iran Cohort Consortium. *BMJ Open*. 2018;8(7):e020303. doi:10.1136/bmjopen-2017-020303
  5. Bagherian Sararoudi R, Sanei H, Ahmadi Tahour Soltani M, Bahrami Ehsan H. Prevalence of anxiety and depression three months after myocardial infarction. *Nurse and Physician within War*. 2015;2(4):117-123. [Persian].
  6. Vilchinsky N, Ginzburg K, Fait K, Foa EB. Cardiac-disease-induced PTSD (CDI-PTSD): a systematic review. *Clin Psychol Rev*. 2017;55:92-106. doi:10.1016/j.cpr.2017.04.009
  7. Singh A, Agrawal S, Gargya S, et al. Posttraumatic stress disorder after myocardial infarction and coronary artery bypass grafting. *Int J Crit Illn Inj Sci*. 2017;7(2):84-90. doi:10.4103/ijciis.ijciis\_27\_17
  8. Meister R, Princip M, Schmid JP, et al. Myocardial Infarction - Stress PREvention INTervention (MI-SPRINT) to reduce the incidence of posttraumatic stress after acute myocardial infarction through trauma-focused psychological counseling: study protocol for a randomized controlled trial. *Trials*. 2013;14:329. doi:10.1186/1745-6215-14-329
  9. Roberge MA, Dupuis G, Marchand A. Post-traumatic stress disorder following myocardial infarction: prevalence and risk factors. *Can J Cardiol*. 2010;26(5):e170-175. doi:10.1016/s0828-282x(10)70386-x
  10. Chung MC, Berger Z, Rudd H. Coping with posttraumatic stress disorder and comorbidity after myocardial infarction. *Compr Psychiatry*. 2008;49(1):55-64. doi:10.1016/j.comppsy.2007.08.003
  11. Edmondson D, Rieckmann N, Shaffer JA, et al. Posttraumatic stress due to an acute coronary syndrome increases risk of 42-month major adverse cardiac events and all-cause mortality. *J Psychiatr Res*. 2011;45(12):1621-1626. doi:10.1016/j.jpsychires.2011.07.004
  12. Ophuis RH, Oliij BF, Polinder S, Haagsma JA. Prevalence of post-traumatic stress disorder, acute stress disorder and depression following violence related injury treated at the emergency department: a systematic review. *BMC Psychiatry*. 2018;18(1):311. doi:10.1186/s12888-018-1890-9
  13. Momeni Ghale Ghasemi T, Musarezaie A, Moeini M, Naji Esfahani H. The effect of spiritual care program on ischemic heart disease patients' anxiety, hospitalized in CCU: a clinical trial. *J Res Behav Sci*. 2013;10(6):554-564. [Persian].
  14. Ferretti F, Pozza A, Bossini L, et al. A comparison of physical comorbidities in patients with posttraumatic stress disorder developed after a terrorist attack or other traumatic event. *J Neurosci Res*. 2019;97(5):543-553. doi:10.1002/jnr.24373
  15. Breslau N, Kessler RC. The stressor criterion in DSM-IV posttraumatic stress disorder: an empirical investigation. *Biol Psychiatry*. 2001;50(9):699-704. doi:10.1016/s0006-3223(01)01167-2
  16. Perkonig A, Kessler RC, Storz S, Wittchen HU. Traumatic events and post-traumatic stress disorder in the community: prevalence, risk factors and comorbidity. *Acta Psychiatr Scand*. 2000;101(1):46-59.
  17. Breslau N, Davis GC, Peterson EL, Schultz L. Psychiatric sequelae of posttraumatic stress disorder in women. *Arch Gen Psychiatry*. 1997;54(1):81-87. doi:10.1001/archpsyc.1997.01830130087016
  18. Tolin DF, Foa EB. Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychol Trauma*. 2008;S(1):37-85. doi:10.1037/1942-9681.S.1.37
  19. Dobie DJ, Kivlahan DR, Maynard C, Bush KR, Davis TM, Bradley KA. Posttraumatic stress disorder in female veterans: association with self-reported health problems and functional impairment. *Arch Intern Med*. 2004;164(4):394-400. doi:10.1001/archinte.164.4.394
  20. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry*. 1995;52(12):1048-1060. doi:10.1001/archpsyc.1995.03950240066012
  21. Berning JN, Poor AD, Buckley SM, et al. A novel picture guide to improve spiritual care and reduce anxiety in mechanically ventilated adults in the intensive care unit. *Ann Am Thorac Soc*. 2016;13(8):1333-1342. doi:10.1513/AnnalsATS.201512-831OC
  22. Moreira-Almeida A, Neto FL, Koenig HG. Religiousness and mental health: a review. *Braz J Psychiatry*. 2006;28(3):242-250. doi:10.1590/s1516-44462006000300018
  23. Brezinka V, Kittel F. Psychosocial factors of coronary heart disease in women: a review. *Soc Sci Med*. 1996;42(10):1351-1365. doi:10.1016/0277-9536(95)00284-7
  24. Francis LJ. The psychology of gender differences in religion: a review of empirical research. *Religion*. 1997;27(1):81-96. doi:10.1006/reli.1996.0066
  25. Krause N, Ellison CG, Marcum JP. The effects of church-based emotional support on health: do they vary by gender? *Sociol Relig*. 2002;63(1):21-47. doi:10.2307/3712538
  26. McFarland MJ. Religion and mental health among older adults: do the effects of religious involvement vary by gender? *J Gerontol B Psychol Sci Soc Sci*. 2010;65(5):621-630. doi:10.1093/geronb/gbp112
  27. Bormann JE, Liu L, Thorp SR, Lang AJ. Spiritual wellbeing mediates PTSD change in veterans with military-related PTSD. *Int J Behav Med*. 2012;19(4):496-502. doi:10.1007/s12529-011-9186-1
  28. Weather FW, Litz BT, Herman DS, Huska JA, Kean T. The PTSD Checklist (PCL). Reliability, Validity & Diagnostic Utility. Presented at: The 9th The Annual Meeting of the International Society for Traumatic Stress Studies; October 1993; San Antonio, Texas.
  29. Goodarzi MA, Shafiei F, Tarikhi A-R. The relationship between religious attitude and the symptoms of post traumatic stress disorder in people who experienced the Bam earthquake. *Journal of Fundamentals of Mental Health*. 2011;13:2(50):182-93
  30. Tajbakhsh F, Hosseini M, Fallahi-Khoshknab M, Rokofian A, Rahgozar M, Mary Davidson P. The effect of spiritual care on depression in patients following coronary artery bypass surgery: a randomized controlled trial. *Religions*. 2018;9(5):159. doi:10.3390/rel9050159
  31. Mirzaee M, Hajivandi A, Khalili A, Jahanpour F. The assessment of the effect of poetry therapy on the post-traumatic stress disorder (PTSD) in myocardial infarction patient. *Iran J Psychiatr Nurs*. 2016;4(2):11-18. doi:10.21859/ijpn-04022