

# Comparison of Quality of Life and Mental Well-Being in Myocardial Infarction Patients and Healthy People

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## Abstract

**Objective:** Quality of life and mental well-being are some of the issues that can play an important role in the disease and its treatment. The purpose of this study was to compare the quality of life and mental well-being of myocardial infarction patients and healthy people.

**Methods:** This is a causal-comparative study with parallel groups. The statistical population of this study was all myocardial infarction patients in Sina hospital in Tehran in 2019. To select sample of the study, 69 myocardial infarction patients and 72 healthy people were selected through available sampling method. Data were collected by the use of the Quality of Life Questionnaire (QoL, SF-36) and Psychological Wellbeing Scale (PWB). Then, the collected data were analyzed by descriptive statistical methods, Mann-Whitney U test, and one-way variance analysis (ANOVA).

**Results:** In terms of quality of life, healthy people were at a higher level compared to patients ( $F=49.90$ ,  $P<0.05$ ), but the score of total quality of life regarding the sex difference was not significant in healthy and patient groups ( $F=1.74$ ,  $P>0.05$ ). Also, the dimensions of mental well-being were higher in healthy subjects than in myocardial infarction patients ( $F=4.41$ ,  $P<0.05$ ) and there was no difference between male and female ( $F=0.01$ ,  $P>0.05$ ).

**Conclusion:** Myocardial infarction patients have a lower quality of life and subjective well-being than healthy people. Based on the results, it is necessary to pay more attention to two variables of quality of life and subjective well-being in the design of interventions to reduce the psychological problems of patients with MI.

**Keywords:** quality of life, myocardial infarction patients, mental well-being, healthy people.

## Introduction

Cardiovascular disease (CVD) is the main cause of mortality in most areas of the world including Iran. It is predicted that by the year 2020, CVD will kill 25 million people in the world (Nyklicek, Vingerhoets, & Marcel Zeelenberg, 2011). According to the WHO report, 41.3% of total death in 2005 and 45% of the whole death in 2011 in Iran was arising from CVD (WHO, 2014). Long term

condition has a significant burden on people and it has a direct impact on people and society health system. Chronic diseases and chronic heart failure were current long term disorders that occur in people simultaneously (Ong, Zautra, & Reid, 2010). On the other hand, CVD, if progresses, can lead to myocardial infarction (MI) that has a huge cost for each country's health system (Aghayousefi, Alipour & Sharif, 2017; Karimi, Kakabarai, Yazdanbakhsh & Moradi, 2014). MI is the most prevalent CV condition that has the second place of disease in advanced and developing countries (Sabahi & Akbarzadeh Tootoonchi, 2014). Evidence suggests that traditional factors only predict half of the MI variance. So, researchers have become interested

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in investigating the psychosocial risk factors of MI (Alipoor, 2011). According to studies, MI patients report serious psychological problems, such as high levels of anxiety, depression, and self-criticism, which can affect patients' health (Sabahi et al., 2014). Also, considering that, the heart is one of the important and sensitive organs, its damage has an undesirable effect on people's mental status. MI is a chronic illness that causes high mortality rate and limitation of life (Seema & Kini, 2012), and some studies have shown that heart problems, such as MI and CVD that have no definitive treatment, affect patients' mind, behavior, and lifestyle (Aliloo, Yarmohammadi, Asl, Bayat & Hoseini, 2011). Furthermore, all of these symptoms and complications have different and significant impacts on an individual's function and quality of life (QoL). Acute MI is accomplished by severe physical problems such as cardiogenic shock, rupture of the heart, ventricular aneurysm, deadly arrhythmia, ischemia, and stroke (Bhimaraj Tang, 2012). Researches have shown that usually, patients with MI have a lower quality of life (Asli Azad, Rajai, Farhadi, Aghasi & Shahidi, 2017). However, CVD and MI as non-communicable and preventive diseases in the human being are preventive and controllable simply and completely (Karimi et al., 2014).

The QoL is meant to be satisfied, happy and pleasant with life (Teresi, & Ocepek-Welikson, 2017). Flyers and Machine (2013), believe that the QoL is the individuals' conception of their life position from cultural point of view, the value system they live in, goals, expectations, standards and their priorities; so it is completely personal and invisible for others, and it is based on understanding of them from different aspects of their lives. The World Health Organization describes the QoL as an "individual's realization of his/her position in life in the context of the prevailing culture and beliefs and in relation to his/her goals and concerns" (Lynch & Cahalan, 2017). Because of illness manifestations

following MI, the QoL could be harmed. Quality of life in MI patients is affected by many factors such as gender, social support, personality, socioeconomic factors, psychological symptoms (e.g. depression and anxiety), angina, and dyspnea (Saengsiri, Thanasilp, & Preechawong 2014). MI is considered chronic diseases that not only does it cause a high mortality rate, but also it creates a decrease in quality of life. This limitation confronts the patients' job tasks, family duties, and social life with problems and causes social isolation and depression (Martin & Marsh 2014). Also, studies have shown that the severity and multiplicity of the disease symptoms are threatening for patients, and the feeling of impending death can lead to anxiety and mood disorders, resulting in struggling with sleep problems and inactivity (Khabaz, Behjati & Naseri, 2011).

On the other hand, the quality of life, as an indicator of a person's health status is a multidimensional concept that refers to the mental evaluation of different aspects of life such as cognitive function and well-being (McCarroll, Armbruster, & Frasure, 2014). This evaluation includes the emotional interaction of a person to accidents and judgments about satisfaction in his/her own life (Kakabayee, Arjmandnia & Afrooz, 2012). Well-being is the experience of health, happiness, and prosperity. It includes having good mental health, high life satisfaction, a sense of meaning or purpose, and the ability to manage stress (Douma, Steverink, Hutter & Meijering, 2017). Mental well-being helps people to have a different view of life. People with high mental well-being experience more positive emotions, so they have a positive evaluation of their environment (Teresi & Ocepek-Welikson, 2017). These people feel higher control of conditions and experience more satisfaction in life. In contrast, people with low mental well-being, evaluate their life negatively and unpleasantly (González-Carrasco, Casas, Malo, Viñas & Dinisman, 2017). Mental

well-being independently protects people from risk factors of cardiovascular disease. Generally, well-being is positively associated with healthy behaviors and biologic functions that are inversely associated with healthy behaviors and biologic functions. Cardiovascular health is correlated with optimism and well-being (Boehm & Kubzansky, 2012). In modern medicine, QoL is a predictor of general well-being that is an important outcome in the treatment of any chronic disease. Outcomes of treatment of any chronic disease are not merely predicted by the frequency and severity of the disease, but also by how this treatment will affect the patient's QoL and general well-being (Pournaghash-Tehrani & Abdoli-Bidhendi, 2017; Teresi & Ocepek-Welikson, 2017).

There is no doubt that chronic diseases have an important and adverse effect on QoL, and it is well known that improvement in it is the final and important goal of family medicine (Saengsiri, Thanasilp, & Preechawong, 2014). Due to the importance of the subject and lack of studies about these variables that have done in Iran, the recent study has aimed to compare the quality of life and mental well-being of patients with myocardial infarction and healthy partner.

### Method

This study was descriptive and causal-comparative with parallel groups. The statistical population includes all patients with myocardial infarction who referred to Sina hospital in Tehran in 2019. The sampling method of this study was available sampling. According to the population of this study, 141 subjects were selected by Morgan sampling table and replaced into 2 groups (69 myocardial infarction patients and 72 healthy people). Inclusion criteria for groups were: chest pain and myocardial infarction, having a diploma education degree, having one symptom of cardiovascular diseases such as chest pain, myocardial infarction, and heart attack. The Exclusion criteria were other chronic

diseases (like cancer, MS, thyroid, etc.). Diagnosis of the disease based on WHO criteria were done by cardiologist considering clinical symptoms, specimen, and paraclinical tests and were inserted in the file. After establishing the initial relationship by expressing the importance of research's goal and creating a sense of trust in the confidentiality of the information, the questionnaires of this study were given to both groups.

### Ethical statement

Initially, informed consent was obtained from patients. The participants were assured that their information would be kept confidential. The participants were briefly explained about the study process and its goals. It was explained that if participants are reluctant to continue, they can stop taking part in the study at any time. It was also mentioned that at the end of the study, the results would be revealed to participants.

### Research instruments

*Quality of Life Questionnaire (Ware & Sherbourne, 1992)*: Quality of life questionnaire (QoL) has 36 statements for evaluating the quality of life. This scale evaluates 8 fields: 1. General health, 2. Physical function, 3. Roleplay limitation for physical reasons, 4. Roleplay limitation for emotional reasons, 5. Body pain, 6. Social function, 7. Fatigue or vitality, and 8. Mental health. In the main form of quality of life questionnaire, the reliability was reported 0.91 by Cronbach's alpha coefficient formula. Zahmatkesh et al. (2012) reported good reliability and validity for it. Internal consistency analysis showed that, except vitality scale ( $\alpha=0.44$ ), other scales of the Persian version of SF-36 have the minimum standard reliability coefficients in the range of 0.77 to 0.90 (Zahmatkesh et al., 2012).

*Psychological Wellbeing Scale (Ryff, 1980)*: The main form of psychological wellbeing scale (PWB) includes 120 questions but further studies

provide shorter forms that include 84, 54 and 18 questions. Ryff's mental well-being scale has 6 subscales, titling autonomy, environmental control, personal growth, positive relationships with others, purposefulness in life, and self-acceptance. The total scores of these 6 factors were calculated as the total score of mental well-being. This test is answered in a 6 points Likert scale from "completely disagree" to "completely agree". Among whole questions, 44 questions are answered directly and 40 questions are answered inverted. At first, this scale performed on 321 samples and the coordinate coefficient among scales was in the range of 0.86 to 0.93 and the reliability coefficient was reached in the range of 0.81 to 0.86 after 6 weeks on 117 samples. In Iran, Bayani, Koochaki, and Bayani (2008) tested the reliability of this scale and internal consistency was measured by using Cronbach's alpha. The result for environment control was 0.77, positive relationship with others was 0.77, personal growth was 0.78, self-acceptance was 0.71, purposefulness in life was 0.70, and autonomy was 0.82 (Tagharobi, 2012).

## Results

Totally, 141 subjects have participated in the research, including 69 patients (33 women and 36 men,  $M = 59.17$  years  $\pm$   $SD = 9.91$ ) and 72 healthy (35 women and 37 men,  $M = 58.79$  years  $\pm$   $SD = 8.41$ ). The results of the t-test ( $P > 0.05$ ) and Chi-square test ( $P > 0.05$ ) showed that there was no difference between the two groups in terms of age and gender, respectively.

Table 1 presents the mean and standard deviation of subscales of QoL and mental well- in both healthy and patient groups.

As seen in Table 1, there is an obvious difference between some of the mean components of QoL and mental well-being in the healthy and patient groups.

According to the results of the Kolmogorov-Smirnov test, which indicated the normal distribution of scores, and also the results of Levin test, which indicated the homogeneity of variance in the scores of the 2 groups of patients and healthy in the total score of QoL, physical and mental

**Table 2:** Mean and standard deviation of subscales of QoL and mental well-being

Quality of life	Patient group		Healthy group	
	Mean	SD	Mean	SD
Physical health	110.11	40.17	129.96	38.23
Mental health	155.34	41.12	122.55	43.64
General health	48.04	13.37	62.12	16.77
pain	42.43	14.08	41.18	13.91
Social function	37.21	20.77	46.95	17.48
Emotional well-being	45.48	18.51	52.76	19.98
Fatigue/energy	38.18	2.13	52.22	19.38
Role disorder of emotional health	33.12	12.75	32/29	9.14
Role disorder of physical health	24.07	16.99	23.04	10.21
Physical function	21.01	16.09	36.80	13.11
<b>Mean and standard deviation of scores of mental well-being subscales</b>				
Self-acceptance	7.09	3.27	10.89	3.56
Self-grown	9.21	4.68	11.33	4.35
Purposeful in life	9.06	3.31	11.97	4.47
Positive relationship with others	6.81	2.26	6.42	2.19
Control of environment	9.58	2.94	9.47	3.44
Dependency	11.36	4.17	11.44	3.78

**Table 2:** Results of ANOVA for comparing QoL in patients and healthy groups

Differences source	S.S	Df	M.S	F	Sig level
group	281301.26	1	28138.26	49.90	0.0001
gender	9835.74	1	9835.74	1.74	0.18
group*gender	505.33	1	505.33	0.09	0.76
error	772199.60	137	5636.49		
total	16354809.25	141			

health ( $p>0.05$ ), ANOVA was used to test the QoL in patients with MI and healthy people. As shown in Table 2, the mean of patients' score in a total score of QoL is 283.78 and in healthy people is 372.96, and this difference is significant ( $p<0.05$ ). It means that healthy people compared to the patients have a higher QoL; however, the mean of a total score of QoL is not significant in gender between males and females of 2 groups.

As shown in Table 3, the mean of patients and healthy people in the physical health subscale is 110.36 vs. 147.81, and in the mental health subscale is 118.34 vs. 164.38, and this difference was significant ( $p<0.05$ ). Healthy people have higher scores in physical and mental health subscales than patients. The interaction of gender with patients' status in each of the total subscales is not significant as shown in table 3 ( $p>0.05$ ).

Also considering the results of Kolmogorov-Smirnov test, it is indicated that the distribution of data is not normalized in each of the subscales of QoL, and the Mann-Whitney U test was used

for investigating the scores' difference of QoL subscales in patients and healthy groups. As shown in Table 4, the rank of healthy people score mean versus patients in general health is 89.28 vs. 51.93, in social function is 81.26 vs. 60.29, in emotional well-being is 87.74 vs. 53.54, in fatigue/energy is 86.38 vs. 54.96, and in physical function is 89.74 vs. 51.45, that have significant difference ( $p<0.05$ ) and show an improvement of this hypothesis but in 3 other subscales of quality of life, patients compared to healthy people have no significant difference ( $p>0.05$ ). It means that some subscales' scores such as pain are 66.40 vs. 75.41, role disorder of emotional health is 71 vs. 71, and role disorder of physical health is 71 vs. 71, and there is no significant difference in 2 groups.

Considering the result of the Kolmogorov-Smirnov test that indicates the normality of scores distribution, and the result of the Levin test that indicates the homogeneity of scores variance between patient and healthy groups in a total score of mental well-being ( $p>0.05$ ), ANOVA analysis

**Table 3:** Results of ANOVA for comparing physical and mental health patients and healthy groups

Differences source	Independent variable	S.S	Df	M.S	F	Sig. level
group	Physical health	48957.23	1	48957.23	34.80	0.0001
	Mental health	75642.20	1	75642.20	45.88	0.0001
gender	Physical health	1208.50	1	1208.50	0.85	0.35
	Mental health	698.84	1	698.84	0.42	0.51
gender*group	Physical health	3288.34	1	3288.34	2.33	0.12
	Mental health	5948.99	1	5948.99	3.60	0.06
error	Physical health	192725.07	137	1406.75		
	Mental health	225833.83	137	1648.42		
total	Physical health	2610643.75	141			
	Mental health	3144705.50	141			

**Table 4:** Results of Mann-Whitney U test for QoL subscales

subscales	group	N	Mean rank	Uman Whitney coefficient	Sig. level
General health	patient	69	51.93	1168	0.0001
	healthy	72	89.28		
pain	patient	69	66.40	2166.50	0.18
	healthy	72	75.41		
Social function	patient	69	60.29	1745	0.002
	healthy	72	81.26		
Emotional well-being	patient	69	53.54	1279	0.0001
	healthy	72	87.74		
Fatigue/energy	patient	69	54.96	11377	0.0001
	healthy	72	86.38		
Role disorder of emotional health	patient	69	71	2484	1
	healthy	72	71		
Role disorder of physical health	patient	69	71	2484	1
	healthy	72	71		
Physical function	patient	69	51.45	1135	0.0001
	healthy	72	71		

was used to test the difference of mental well-being between MI patients and healthy subjects. As shown in Table 5, the mean of the patient's score in mental well-being is 56.85 and in healthy people is 54.16 ( $p < 0.05$ ). The interaction of 2 groups by gender as shown in Table 5 was not significant ( $p > 0.05$ ).

Also as an alternative finding and concerning the result of the Kolmogorov-Smirnov test that indicates an abnormality of data distribution in each of mental well-being subscales, to investigate the difference of well-being subscales' scores in healthy and patient groups, the Mann-Whitney U test was used. As shown in Table 6, the rank of mean score of patients versus healthy people in subscales of self-acceptance is 80.67 vs. 61.74, self-growth is 78.45 vs. 86.63, purposeful in life is 88.78 vs. 63.45, that is significantly higher ( $p < 0.05$ ), but

patients versus healthy people in some subscales like positive relationship with others is 97.68 vs. 94.72, environment control is 73.25 vs. 84.68 and independency is 98.73 vs. 68.15, that shows no significant difference ( $p > 0.05$ ).

### Discussion and Conclusion

The aim of this study was to compare the QoL and mental well-being of myocardial infarction patients and healthy people. According to the findings of the study, healthy people had a higher QoL than patients; however, the mean of a total score of QoL by gender in women and men of healthy and patient groups was not significant. The patient and healthy subjects' scores in physical and mental health subscales were significantly different. Healthy people had a higher score in physical and mental health than patients, but the interaction of gender

**Table 5:** Results of ANOVA for comparing the total score of mental well-being in groups

Differences source	S.S	df	M.S	F	Sig. level
group	255.43	1	255.43	4.41	0.03
gender	1.12	1	1.12	0.01	0.88
Group/gender	2.77	1	2.77	0.04	0.82
error	7920.72	137	57.81		
total	442217	141			

**Table 6:** Results of Mann-Whitney U test for mental well-being subscales

Subscale	Group	N	Mean rank	Uman Whitney coefficient	Sig. level
Self-acceptance	patient	69	80.67	1817	0.005
	healthy	72	61.74		
Self-grown	patient	69	78.45	1970	0.03
	healthy	72	63.86		
Purposeful in life	patient	69	78.88	1940.50	0.02
	healthy	72	63.45		
Positive relationship with others	patient	69	68.97	2344	0.55
	healthy	72	72.94		
Control of environment	patient	69	73.25	2328.50	0.51
	healthy	72	68.84		
Dependency	patient	69	73.98	2278.50	0.39
	healthy	72	71.06		

and patience status in each of the general subscales was not significant. Also, the score of healthy people compared to patients in some subscales as general health, social function, emotional well-being, fatigue/energy, and physical function had a significant difference, but in other subscales of QoL, patients compared to healthy partners had no significant difference.

This finding is in line with other studies such as the research of Bhimaraj and Tang (2012) and Janson and Moss-Morris (2017). The results of their studies show that the CVD makes some limitations for patients and confronts their job tasks, family duties and social life with troubles and causes social isolation and depression. Janson and Moss-Morris (2017) believed that patients with MI compared to other chronic patients, like chronic obstructive pulmonary diseases, arthritis, and unstable angina, have a lower QoL. Afsharinia and Bahrami (2018) and Johansson, Dahlstrom, and Brostrom (2008) have shown that healthy people were at a higher level of QoL and there was no difference between cardiovascular and patients with cancer.

Teresi and Ocepek-Welikson (2017) in a study on 196 patients with MI and 196 healthy people, showed that there was a significant difference among QoL and general health status components, physical health, psychological and life environment fields in patients and healthy people. On the other

hand, Zambroski, Moser, Bhat, and Ziegler (2005) specified in their research that weak function and depression create the undesirable quality of life for cardiovascular patients. Also, Riedinger et al. (2009) believed that women with heart failure have a lower quality of life than those with other chronic diseases. Concerning to findings of these studies, it can be explained that CVD and MI, as independent factors, have a negative impact on the quality of life of patients. In general, studies show that patients with MI had significantly better QoL (global, as well as physical, emotional and social aspects) than patients with stable coronary artery disease or heart failure (Zambroski et al., 2005). Depression and anxiety occur at high rates among patients suffering from MI. Both depressive symptoms and anxiety adversely affect in-hospital and long term cardiac outcomes of post-MI patients independent of traditional risk factors, and these disorders, in turn, can lead to a decline in quality of life (Afsharinia & Bahrami, 2018). Also, patients who attach lower scores on the quality of life is likely to be effective in relieving the disease or maintaining the symptoms and may be considered during the treatment of these patients (Janson, & Moss-Morris, 2017).

Another finding of a recent study showed that there was no significant difference between scores of QoL among women and men that this is in line with Carrasco-

Garrido et al. (2009). They explained that there is no significant difference between women and men in scores of physical health, while it is significant in the mental health that is better in men than women. On the other hand, Riedinger, Dracup, and Brecht (2009) showed in their research that women with heart failure compared to women with other chronic disease have a lower QoL.

According to the findings of the study, there is a significant difference between the score of healthy people and patients in mental well-being, but the interaction of groups by their gender is not significant. Patients versus healthy people in subscales like self-acceptance and self-grown and purposeful in life were significantly higher; however, subscales of relationship with others, environment control, and independence had no significant difference. The result of this study is in line with Jalkonen et al. (2006), Pap et al. (2013) and Aliloo et al. (2012). Jalkonen et al. (2006) showed that in cardiovascular patients feeling of connection is related to the ability of anger control, while suspicion, outside anger, and inside anger have a negative correlation with physical well-being. Pap et al. (2013) showed that there is a complex, multifactorial and nonlinear relation between the mental well-being and sexual activity of patients with congenital heart disease. Aliloo et al. (2012) found that the psychological well-being of patients with CVD is relatively moderate or even lower compared to healthy people.

To explain the findings, it can be said that cardiovascular disease can have an undesirable impact on life, mental health and well-being of these patients indirectly because this disease has a huge mental and physical cost on patients and their families. They lost their motivation and goal, so their self-acceptance and environment control are ruined. They cannot have a good relationship with others (Pap et al., 2013). However, well-being mediated the relationship between social network degree and disability. In patients with MI, low environmental mastery has emerged as

a useful screen for identifying those vulnerable to developing depression and decreasing well-being. Also, in MI patients psychological factors, including wellbeing, have been linked to adjustment in patients suffering from hypertension as well as heart failure, thereby underscoring the importance of well-being in understanding the course of illness (Jalkonen et al., 2006). On the other hand, there is a high likelihood of psychological symptoms, such as depression, anxiety, autonomy, low self-esteem, and unpleasant quality of life in MI patients, and this can reduce the achievement of components of well-being as purposeful in life, self-grown, and environment control (Aliloo et al., 2013). MI patients are psychologically disadvantaged, distancing themselves from normal life because they require special care, examination, and treatment, as well as special medication, so this stressful experience can lead to reduced well-being. However, people with higher level of mental well-being are always in the process of searching for the meaning of positive emotions like happiness, vitality, and willpower, so they experience more satisfaction in their life and they have more ability to tolerate undesirable situations such as diseases or stressful conditions; this will increase their inner satisfaction.

MI patients have lower mental well-being and quality of life versus healthy people. Patients' quality of life and well-being are adversely affected due to various complications of these patients. This can exacerbate and worsen the disease and its consequences. Therefore, special attention should be paid to the improvement of quality of life and well-being in MI patients in the formulation of policies for the prevention and control of cardiovascular diseases and similar disorders.

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## References

- Afsharnia, F. Beyrami, M. the comparison of quality of life and psychological well-being in cardiovascular patients, patients with cancer and healthy partners; *journal of society health and education*; 5(3):38-47.
- Aghayousefi, A., Alipour, A., & Sharif, N. (2017). The Effect of Coping Therapy on Immunological Indicators in Patients with Coronary Heart Disease. *Iranian Journal of Health Psychology*, 1(1), 19-28.
- Aliloo, M. Yarmohammadi, M. Asl, M. Bayat, A. Hoseini, E. (2012). The investigation of components of psychological well-being in cardiovascular patients refer to ekbatan hospital in hamedan related to gender, age, and education. *journal of razi medicine*; 22(139): 35-46.
- Asli Azad, M., Rajai, R., Farhadi, T., Aghasi, A., & Shahidi, L. (2017). The Relationship between hardiness and resilience dimensions of burnout among caregivers physically handicapped, *mentally and diversity of Isfahan. Public Health*; 10(2):24-32.
- Bayani, A. Koochaki, A. Bayani, A. (2008). The Ryff validity and reliability of psychological well-being subscale. *journal of psychiatric and clinical psychology of Iran*; 14(2):151-146.
- Bhimaraj A, Tang, W. H. (2012). Role of oxidative stress in disease progression in stage B, a Pre-cursor of Heart Failure. *Heart Fail Clin*; 8: 101-11.
- Boehm, J.K., Kubzansky, L.D. (2012). The heart's content: the association between positive psychological wellbeing and cardiovascular health. *Psychol, Bull*; 138(12): 655–691.
- Carrasco-Garrido P, de Miguel-Diez J, Rejas-Gutierrez J, Martin-Centeno A, Gobartt- Vazquez E, Hernandez-Barrera V, et al. (2009). Characteristics of chronic obstructive pulmonary disease in Spain from a gender perspective. *BMC Pulm Med*; 9: 12-26.
- Douma, L., Steverink, N., Hutter, I., Meijering, L. (2017). Exploring subjective well-being in older age by using participant-generated word clouds. *Gerontologist*; 57(2):229-39.
- Dowell P, Lyons K, Schmidt P, Pahwa R. (2017). Impact of off time on quality of life and caregiver burden in parkinson's disease. *Neurology*;88-101 :(7)16 .
- Fayers, P., & Machin, D. (2013). Quality of life: the assessment, analysis and interpretation of patient-reported outcomes. John Wiley & Sons.
- González-Carrasco, M., Casas, F., Malo, S., Viñas, F., & Dinisman, T. (2017). Changes with age in subjective well-being throughh the adolescent years: Differences by gender. *J Happiness Stud*;18(1):63-88
- Jalkonen J, Ehlestrom Y H. (2006). Metabolic Syndrome Is Associated with Delayed Heart Rate Recovery after Exercise. *J Korean Med Sci*; 21: 621-6.
- Janson, N., & Moss- Morris, C. (2017). *Effortful control and its socioemotional consequences*. In J. J. Gross (Ed.), *Handbook of emotion regulation*. New York: Guilford Press.
- Johansson, P., Dahlstrom, U., & Brostrom, A. (2008). Factors and interventions influencing health-related quality of life in patients with heart failure: a review of the literature. *Eur J Cardiovasc Nurs*; 5(1): 5-15.
- Kakabrayee, K., Arjmandnia, A., Afrooz, G. h. (2012). [Relationship between coping styles and perceived social support with psychological subjective well-being scales among parents of regular and mentally ill childrenin Kermanshah. *Research on exeptional children*; 2(7): 1-26.
- Karimi, S. Kakabarai, K. Yazdanbakhsh, K. & Moradi, G. H. (2014). the effectiveness of cognitive-behavioral therapy on cardiovascular patients' well-being. *periodical of medicine university of Kermanshah*; 18(3):147-157.
- Khabaz, M. Behjati, Z. Naseri, M. (2011), the relation of social support and styles of confronting with tolerance in boy teenagers. *Journal of applied psychology*, 4(20):67-81.
- Lynch, J., & Cahalan, R. (2017). The impact of spinal cord injury on the quality of life of primary family caregivers: a literature review. *Spinal cord*; 55(11): 964-978.
- Martin, A., J. & Marsh, H. (2014). Academic resilience and itspsychological and educationa correlations: a construct validity approach, *Psychology in the Schools*,43(1), 267-281.
- McCarroll, M. L., Armbruster, S., & Frasure, H. (2014). Functional, quality of life, and neurodevelopmental outcomes after congenital cardiac surgery, *Seminars in Perinatology*; 40(8): 556-570.
- Nyklicek, I., Vingerhoests, A. D. & Marcel Zeelenberg,

- M. (2011). Emotion Regulation and Well-being. *New York, Dordrecht Heidelberg London*; 2(3) 101-115.
- Ong, A. D., Zautra, A. J., & Reid, M. C. (2010). Psychological resilience predicts decreases in pain catastrophizing through positive emotions. *Psychology and aging*, 25(3), 516.
- Pap, D., Čolak, E., Majkić-Singh, N., Grubor-Lajšić, G., & Vicković, S. (2013). Lipoproteins and other risk factors for cardiovascular disease in a student population. *Journal of medical biochemistry*, 32(2), 140-145.
- Pournaghash-Tehrani, S., & Abdoli-Bidhendi, M. R. (2017). Psychological factors, Sexual Dysfunction and Quality of Life in Revascularization Procedures: A Pre and Post Evaluation Study. *Iranian Journal of Health Psychology*, 1(1), 9-18.
- Riedinger, M. S., Dracup, K. A., & Brecht, M. L. (2009). Quality of life in patients with heart failure: do gender differences exist?. *Heart Lung*; 30(2): 105-16.
- Ryff, C. (1996). Psychological well-being: meaning, measurement, and implications for psychotherapy research. *Psychother Psychosom*; 65(1):14-23.
- Sabahi, F., & Akbarzadeh Tootoonchi, M. (2014). Comparative evaluation of risk factors in coronary heart disease based on fuzzy probability-validity modeling. *J Zanzan Univ Med Sci.*; 22(13):73-83 .
- Saengsiri, A. O., Thanasilp, S., & Preechawong, S. (2014). Factors predicting quality of life for coronary artery disease patients after percutaneous coronary intervention. *Asian Biomedicine*, 8(1), 31-42.
- Seema, P., & Kini, L. (2012). Overview of health status quality-of-life measures review article. *J Dermato Clin*; 30: 209-21.
- Tagharobi, z. sharifi, kh. Solooki, z. (2012), well-being of nursery and midwifery in students of faculty of kashan. *Journal of nursery and midwifery of hamedan*;20(1):54-62.
- Teresi, J. A., & Ocepek-Welikson, K. (2017). Methodological issues in measuring subjective well-being and quality-of-life: Applications to assessment of affect in older, chronically and cognitively impaired, ethnically diverse groups using the feeling tone questionnaire. *Appl Res Qual Life*;12(2):251-88.
- World Health Organization. (WHO). (2014). *Global status report on non communicable diseases*. Geneva.
- Zahmatkeshan, n. bagherzadeh, r. akaberian, sh. Yazdankhahfard, m. mirzai, k. yazdanpanah, s. khoramroodi, r. gharibi, t. kamali, f. (2012), the investigating quality of life and related factors in elderly of booshehr city. *Journal of medicine university of fasa*; 2(1):53-58.
- Zambroski, C. H., Moser, D. K., Bhat, G., & Ziegler, C. (2005)). Impact of symptom prevalence and symptom burden on quality of life in patients with heart failure. *Eur J Cardiovasc Nurs*; 4(3): 198-206.