



HOSPITAL ANXIETY AND DEPRESSION OF PATIENTS WITH HEART FAILURE IN SOUTH PUNJAB PAKISTAN: A SECTIONAL SURVEY STUDY

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ARTICLE INFO

Article history:

Received 15 July 2019

Received in revised form 16

December 2019

Accepted 26 December 2019

Available online 09 January

2020

Keywords:

Heart failure patients;
Hospitalized Patients;
Borderline of anxiety and
depression; Hospital
Anxiety and Depression
Scale (HADS); Heart
failure (HF).

ABSTRACT

Depression and anxiety are highly prevalent in Heart failure patients. The main objective of the study is to check the prevalence of anxiety and depression and associated factors of Heart Failure Patients of South Punjab Pakistan. A sample of 192 Hospital admitted patients whose age range was between 27-71 years were selected from various cardiac hospitals of south Punjab Pakistan for January-July 2017 through a purposive sampling technique. The Hospital Anxiety and Depression Scale (HADS) was used to assess the level of depression and anxiety among patients. The social and psychological parameters including family care, gender, and relevant support were identified. Findings revealed a highly significant correlation between the level of anxiety and depression among Hospitalized heart failure patients. According to results anxiety and depression is higher among unmarried and patients with low family care and support. In addition, data has indicated that economic factors associated with poverty mediate the frequency of anxiety and depression. It was determined that approximately 50% and 54% of peoples were involved in anxiety and depression respectively, however, 31% of people were regarded in the borderline of anxiety and depression and most patients were accompanied by heart disease. Furthermore, marital status, the difference in income level also promotes anxiety and depression in patients associated with heart disease.

Disciplinary: Health Sciences (Health Management), Psychological Sciences.

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1. INTRODUCTION

Heart failure (HF) is a serious chronic progressive disease with significant worldwide prevalence and mortality [1]. The clinical picture of HF patients manifested by a group of symptoms including pleurisy, difficult breathing, wheezing cough, generalized edema, decrease appetite, tiredness, fatigue, malaise, rapid heartbeat, sleep apnea, confused thinking, loss of memory, poor social and psychological functioning due to resultant depression, anxiety and stress [2].

The leading pathological factors of HF are hypertension, cardiomyopathy, congenital heart disease, lung disorder, diabetes and obesity [3]. Anxiety and depression are common among the patients of HF. It may worsen their symptoms requiring hospitalization for intensive emergency care^[4]. Such malign psychological disorders eventually distort patients' physical health.

Research also highlights that cardiologists only focus on the clinical pictures of HF by ignoring the resultants psychological stressors i.e. anxiety and depression, which further deteriorate the HF patient's health. Depression plays a vital role to cause high blood pressure and many other cardiac ailments including CVD and CAD [5, 6].

Several studies revealed that anxiety and depression and CAD are correlated with one another^[7]. Recently research revealed that depressive patient with MI has a high mortality rate whereas during hospitalization the depressive state of patient leads to CVD [8,9]. The hospitalized HF patients who seldom visit by their family or those who are unmarried often seek a high level of anxiety and depression which may cause impairments of their routine activities [10, 11]. Several types of research show that there is an association between anxiety, depression and hospitalized HF patients[9]. Although it is highly critical to surviving with advanced heart failure because of the sudden worsening situation the patient has to be readmitted in the hospital.

In the modern developed countries, health care teams adopted various strategies with the aim to improve quality of life, enhancing patient endurance along with reduced hospital stay. Such action may play a vital role to curtail the rate of anxiety and depression among HF patients. Patients with heart failure admitted to the hospital have a high incident rate (>50%), have a 10 to 15% mortality rate whereas it is up to 30 to 40 % in case of re-hospitalization within 6 months duration of discharge [12,13]. Studies revealed that approximately less than 1/3 hospitalized HF patients were assessed by a cardiac health professional in the early 90 days after discharged from hospital [13, 14]. To reduce the re-hospitalization rate it is necessary to adopt new strategies including family care at home, long-term hospital care programs involving palliative care treatment [15].

Another study [16] shows that depression expressed by physical complaints or hospitalization the non-serious attitude by a cardiologist, nursing staff, and attendants to ignoring the magnitude of depression ultimately damage the HF patient's health and quality of life. Early understanding, delectation, and curative treatment of anxiety and depression certainly improve the HF patient's health and quality of life[9]. During hospitalization HF patients generally observe anxiety and depression which can intensify clinical physical ailments, along with sluggishness and social isolation [10]. Unfortunately, even after coronary artery bypass grafting (CABG), depression remains untreated then certainly the morbidity rate and mortality will be high [17].

Heart failure patients with depression remain anxious to readmit in the hospital also have a high risk of mortality [14]. Numerous studies show that HF patients living style and standards associated with anxiety and depression such as poor diet, alcohol consumption, smoking/tobacco habits, lack of exercise and social support will interfere with treatment and allied healthcare support [18]. The

cardiac patient plus generalized anxiety disorder has a high risk of severe morbidity as compared to those who not suffered from anxiety or generalized anxiety disorder (GAD) [19]. Social and family environment also affects cardiac events. The studies found that there is a positive correlation between the socioeconomic statuses, family psychosocial environment and cardiovascular diseases [20].

The literature clearly indicates a high level of prevalence of depression and anxiety among heart failure patients in different regions of the world. As such study has not conducted in Pakistan, so it was planned to check the prevalence of hospital anxiety and depression and related social and psychological factors in the south part of Pakistan.

2. METHODS

For this study, the samples were collected from 192 Hospitalized Heart failure (HF) patients were chosen from Nishtar Hospital, Multan, Pakistan and Chaudhry Pervaiz Elahi Institute of Cardiology, Multan, Pakistan (78 and 114 respectively) from January 2017-to- July 2017 by using the method of purposive sampling. Most of HF patients were re-hospitalized. The demographic variables were age, education, residential area, gender, marital status, and family care and support. To collect the detailed information and observing basic parameters including anxiety and depression among hospitalized heart failure patients. Purposely, heart failure patients with the phenomena of anxiety and depression issues were targeted. The questionnaire was filled completely by the consent of all participants. All the instructions and relevant assistance were provided from the hospital team to fill this Performa honestly. The same methodology was applied to observe the differences among people with low and high income and support from the family

Ethics and Consent: Ethical approval was taken from Shandong University China to conduct the study and verbal consent was taken from patients after briefing them about the purpose of the study.

The Hospital Anxiety and Depression Scale (1983). The Hospital Anxiety and Depression Scale (HADS) developed by Zigmond and Snaith^[21] to gauge anxiety and depression in a general therapeutic populace of patients. The scale consisted of 14 items with responses being scored on a scale of 0-3 where a higher score reflects frequencies of symptoms. In spite of the fact that the tension and despondency questions are blended inside the survey, it is indispensable that these are scored independently. Cut-off scores are accessible for evaluation, for instance, a score of at least 8 for uneasiness has a specificity of 0.78 and affectability of 0.9, and for gloom a specificity of 0.79 and an affectability of 0.83.

Before starting, patients were made a request to give permission that they have complete knowledge about this study and willing to take an interest in this study. Instructions were provided to all candidates to complete the questionnaire with honesty to minimize any chances of error. The demographic sheet and Hospital Anxiety and Depression Scale were provided to all candidates to examine the anxiety and depression index in these patients. Purposive sampling method was applied to collect the sample from these enrolled patients associated with heart failure disease. Subjects were also given the assurance that their information will not be disclosed. Participated patients were approached at hospitals to administer the study instruments and help to complete the questionnaire. The questionnaire took 2 to 5 minutes to complete. To determine the scoring scale of HADS, the data were analyzed by using SPSS 21. Pearson correlation coefficients tool was used to finding the linkage of all the variable parameters with each other. Comparisons between marital status for depression and

anxiety were analyzed via an independent samples *t*-test with corrections made for assumed variance equality. We adopted the same methodology to find the difference among participants with less family support and care with participants with more family support and care. One way ANOVA and post hoc tests were used to analyze the differences between depression and anxiety among different income levels. A *P*-value of less than 0.05 was considered significant.

3. RESULTS

Table 1 shows descriptive statistics of socio-demographic variables for this study. From overall 192 patients, most patients 122(63.5%) are between the age of 31 to 45 years, 112 (58%) male and 119 (62%) are single. Furthermore, 104 (54%) of the respondents who give their response as low family care. Similarly, 51 (27%) of the patients have less than 15000 PKR, 50 (26%) belong to 30000-45000 PKR of the patients' monthly income level.

Table 1: Descriptive Statistics of sociodemographic variables of the participants (n=192)

Individual factors	Category	Frequency (%)
Age	<31 Years	33(17.2)
	31-45 Years	122(63.5)
	45-60 Years	33(17.2)
	> 60 Years	4(2.1)
Gender	Male	112 (58.0)
	Female	80 (42.0)
Marital Status	Single	119 (62.0)
	Married	73 (38.0)
Family Care and Support	Low	104 (54.0)
	High	88 (46.0)
Monthly Income (Rupees)	<15000	51 (27.0)
	15000-3000	36 (19.0)
	30000-45000	50 (26.0)
	45000-60000	31 (16.0)
	>60000	24 (12.0)

Table 2: Categories of Anxiety and Depression on the Basis of Scores

Categories	Anxiety Frequency (%)	Depression Frequency (%)
Normal	36 (19.0)	28 (15.0)
Borderline Abnormal	60 (31.0)	59 (31.0)
Abnormal	96 (50.0)	105 (54.0)

Table 2 and diagram 1 shows the prevalence of hospital anxiety and depression level in the sampled patients. There are 60 (31%) and 96 (50%) of the patients who have a borderline abnormal and abnormal level of anxiety respectively. Similarly, 59 (31%) and 105 (54%) of the heart failure patients show borderline abnormal and abnormal depression level respectively.

Table 3: Pearson Correlation between anxiety and depression (n=192).

	Depression
Anxiety	0.736***

(***p<0.001)

Table 3 explores the correlation between anxiety and depression in patients associated with heart failure. The value of the correlation coefficient shows that anxiety and depression are significantly positively correlated with each other.

Table 4: Mean, Standard Deviation and t- value for the score of single (n=119) and married (n=73) on the scale of anxiety and depression.

Variable	Marital Status	N	M	SD	T	P
Anxiety	Single	119	10.85	2.91	2.856	<.003
	Married	73	9.64	2.72		
Depression	Single	119	11.26	2.73	3.357	<.001
	Married	73	9.90	2.70		

Table 4 depicts the frequency of depression and anxiety for the single and married hospitalized heart failure patients. The results show that the level of anxiety and depression is higher in single as compared to married patients.

Table 5: Mean, SD and t-value for the score of low family care and support (n=104) and high family care and support (n=88) on the scale of anxiety and depression.

Variable	Family Care and Support	N	M	SD	T	P
Anxiety	Low	104	10.85	2.94	2.404	<.009
	High	88	9.85	2.75		
Depression	Low	104	11.20	2.81	2.502	<.007
	High	88	10.24	2.68		

Table 6: One Way ANOVA: Anxiety and depression level among hospitalized heart failure patients with variation in income.

Variable	Sum of Squares	Df	Mean Square	F	Sig.	
Anxiety	Between Groups	106.952	4	26.738	3.359	<.011
	Within Groups	1488.752	187	7.961		
	Total	1595.703	191			
Depression	Between Groups	147.364	4	36.841	5.145	<.001
	Within Groups	1339.131	187	7.161		
	Total	1486.495	191			

Table 7: Post Hoc Tests Multiple Comparisons.

Dependent Variable	(I) Income Status	(J) Income Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Anxiety	Up to 15000	15000-30000	.312	0.614	0.612	-0.900	1.524	
		30000-45000	.518	0.562	0.358	-0.590	1.625	
		45000-60000	1.956*	0.643	0.003	0.689	3.224	
		Above 60000	1.743*	0.698	0.013	0.365	3.121	
	15000-30000	30000-45000	.2056	0.617	0.739	-1.011	1.422	
		45000-60000	1.644*	0.691	0.018	0.280	3.008	
		Above 60000	1.431	0.744	0.056	-0.036	2.897	
	30000-45000	45000-60000	1.439*	0.645	0.027	0.166	2.711	
		Above 60000	1.225	0.701	0.082	-0.157	2.607	
	45000-60000	Above 60000	-.214	0.767	0.781	-1.727	1.300	
	Depression	Up to 15000	15000-30000	.444	0.583	0.446	-0.705	1.594
			30000-45000	.767	0.533	0.152	-0.284	1.817
45000-60000			2.151*	0.609	0.001	0.948	3.353	
Above 60000			2.333*	0.662	0.001	1.027	3.640	
15000-30000		30000-45000	.322	0.585	0.582	-0.832	1.476	
		45000-60000	1.707*	0.656	0.010	0.413	3.000	
		Above 60000	1.889*	0.705	0.008	0.498	3.280	
30000-45000		45000-60000	1.384*	0.612	0.025	0.177	2.591	
		Above 60000	1.567*	0.665	0.019	0.256	2.878	
45000-60000		Above 60000	-.183	0.728	0.802	-1.618	1.253	

Table 5 explores that the index of anxiety and depression was higher in patients with less care

and support from the family compared to the patients having more family care and support.

The significant difference in anxiety and depression among different income levels patients was observed in Tables 6 and 7 that the p-value for anxiety and depression are 0.011* and 0.001** respectively, which show that there is a highly significant difference in depression and anxiety among different income status.

Furthermore, from the Post Hoc test, we can also conclude that the maximum difference in the level of anxiety is between income group “up to 15000” and “45000-60000”. Similarly, depression is much higher in the patients belongs to the “up to 15000” income group also the group belongs to “above 60000 income group”.

Table 8: Regression Analysis: Anxiety and Depression on Age, Gender, Marital Status, Family Care and Support and Income Level.

Dependent	Predictor	B	SE (β)	T	P	95% Confidence Interval for β	
						Lower Bound	Upper Bound
Anxiety	Age	0.025	0.023	1.065	<.288	-0.021	0.071
	Gender	1.211	0.390	3.102	<.002	0.441	1.981
	Marital Status	-1.207	0.400	-3.018	<.003	-1.996	-0.418
	Family Care and Support	-0.693	0.392	-1.769	.079	-1.466	0.080
	Income level	-0.527	0.144	-3.652	<.001	-0.812	-0.242
Depression	Age	0.023	0.022	1.034	.302	-0.021	0.067
	Gender	0.158	0.375	0.421	.674	-0.581	0.897
	Marital Status	-1.364	0.384	-3.555	<.001	-2.122	-0.607
	Family Care and Support	-0.765	0.376	-2.035	<.043	-1.507	-0.024
	Income level	-0.616	0.139	-4.446	<.001	-0.889	-0.343

Results Table 8 shows that gender, marital status, and income level have a significant effect on anxiety while no significant effect seen on the basis of age and support and care from family. Similarly marital status, support, and care from family and income level have significant on depression which there is no significant effect of age and gender on depression.

4. DISCUSSION

The heart failure patients generally experience frequent hospitalization within 3 to 6 months due to their sudden health situation. About one-half of heart failure patients have to experience re-hospitalization. In this way, the mortality rate among heart failure patients is higher generally. Hospitalization incurs depression and anxiety among heart failure patients which further deteriorates the status of the heart. The study revealed that epidemiology of anxiety and depression is mainly due to the poor prognosis of heart failure and longer hospitalization. Results revealed a high level of abnormal depression and anxiety in the majority of the candidates associated with a heart problem.

Upon extensive review, it has been found that several patients associated with heart problems were involved in anxiety and depression during the course of their disease [22, 23]. Almost 15-20 percent of hospitalized patients with heart failure is diagnosed with major depressive disorder [24, 25]. A systematic review revealed that Anxiety is a big predictor of hospitalization in heart failure patients[26]. A meta-analysis [27] reported the incidence and frequency of anxiety disorders in heart failure patients.

A highly significant positive correlation was found between anxiety and depression among hospitalized heart failure patients. According to existing literature anxiety and depression are highly

prevalent among heart failure patients [28, 29, 30, 31].

It was hypothesized in this study that single patients who don't have life partners will have more anxiety and depression as compared to married counterparts. The results supported the hypotheses and found a significant difference in both married and unmarried groups. The frequency of depression and anxiety was higher among young unmarried patients. Previous literature also supports this finding that elderly unmarried patients have depressive symptoms and it had a strong impact on their recovery as well^[32, 33, 34]. Another remarkable finding of this study discusses that lack of family care and support also triggers the anxiety and depression among hospitalized heart failure patients. Studies have enormously focused on the role of social support, it has been found as a very protective factor against unpleasant effects [35,36]. Re-hospitalization has a strong association with anxiety and depression [37].

Further, the study revealed a highly significant difference in anxiety and depression among patients with different income status [38]. Depression epidemiology among HF hospitalized patients is higher and associated with fear of readmission. Re-hospitalization ultimately exerts a havoc blow on the economic status of HF patients [39]. This triggers the level of anxiety and depression among hospitalized HF patients.

5. CONCLUSION

In conclusion, anxiety and depression among hospitalized heart failure patients are certainly significant. The level of the psychological clinical picture entirely depends upon the state of HF and admission or readmission in the hospital. Acknowledgment of this causative factor and their outcomes is essential for future studies to curtail the barrier to curative effective HF treatment. The cardiologists should try their best to adopt certain advance approaches to reduce the hospitalization rate among HF patients. The psychologist should also visit HF patients to reduce the level of depression.

6. AVAILABILITY OF DATA AND MATERIAL

Data can be made available by contacting the corresponding author.

7. REFERENCES

- [1] Ruiz-Hurtado G, Sarafidis P, Fernández-Alfonso MS, Waeber B, Ruilope LM. Global cardiovascular protection in chronic kidney disease. *Nature Reviews Cardiology*. 2016, 13(10):603.
- [2] Yelwanti CG, Desai VA. KEYWORDS Heart Failure, Coronary Artery Disease, Dilated Cardiomyopathy, Hypertension, Rheumatic Heart Disease, Cor Pulmonale, Anaemia. A Study on Clinical and Aetiological Profile of Heart Failure at Kbn Teaching and General Hospital. 2016, 17(95168)
- [3] Lee WS, Kim J. Diabetic cardiomyopathy: where we are and where we are going. *The Korean Journal of internal medicine*. 2017, 32(3): 404.
- [4] Cowie MR, Anker SD, Cleland JG, Felker GM, Filippatos G, Jaarsma T, Jourdain P, Knight E, Massie B, Ponikowski P, López-Sendón J. Improving care for patients with acute heart failure: before, during and after hospitalization. *ESC Heart Failure*. 2014, 1(2):110-45.

- [5] Richards SH, Anderson L, Jenkinson CE, Whalley B, Rees K, Davies P, Bennett P, Liu Z, West R, Thompson DR, Taylor RS. Psychological interventions for coronary heart disease: Cochrane systematic review and meta-analysis. *European journal of preventive cardiology*. 2018, 25(3):247-59.
- [6] Yelwanti CG, Desai VA. A Study on Clinical And Aetiological Profile of Heart Failure at Kbn Teaching and General Hospital. *Journal of Evidence Based Medicine and Healthcare*. 2016, 3(83):4509-14.
- [7] Frasure-Smith N, Lespérance F. Depression and anxiety as predictors of 2-year cardiac events in patients with stable coronary artery disease. *Archives of general psychiatry*. 2008, 65(1):62-71.
- [8] Hammash MH, Lennie TA, Crawford T, Heo S, Chung ML, Biddle MJ, Dekker R, Wu JR, Rayens MK, Moser DK. Depressive Symptoms: Mediator of Event-Free Survival in Patients With Heart Failure. *Western journal of nursing research*. 2017, 39(4):539-52.
- [9] Jiang W, Alexander J, Christopher E, Kuchibhatla M, Gaulden LH, Cuffe MS, Blazing MA, Davenport C, Califf RM, Krishnan RR, O'connor CM. Relationship of depression to increased risk of mortality and rehospitalization in patients with congestive heart failure. *Archives of internal medicine*. 2001, 161(15):1849-56.
- [10] Navathe AS, Zhong F, Lei VJ, Chang FY, Sordo M, Topaz M, Navathe SB, Rocha RA, Zhou L. Hospital readmission and social risk factors identified from physician notes. *Health services research*. 2018 Apr;53(2):1110-36.
- [11] Ruminjo IN. *Retired, Unmarried, Male Baby Boomer Attitudes and Behaviors Toward Disease Prevention* (Doctoral dissertation, Walden University):2017.
- [12] Berry C, Murdoch DR, McMurray JJ. Economics of chronic heart failure. *European journal of heart failure*. 2001, 3(3):283-91.
- [13] Leong KT, Wong LY, Aung KC, Macdonald M, Cao Y, Lee S, Chow WL, Doddamani S, Richards AM. Risk Stratification Model for 30-Day Heart Failure Readmission in a Multiethnic South East Asian Community. *American Journal of Cardiology*. 2017, 119(9):1428-32.
- [14] Ou L, Chen J, Hillman K, Flabouris A, Parr M, Assareh H, Bellomo R. The impact of post-operative sepsis on mortality after hospital discharge among elective surgical patients: a population-based cohort study. *Critical Care*. 2017, 21(1):34.
- [15] Feldman DI, Valero-Elizondo J, Salami JA, Rana JS, Ogunmoroti O, Osondu CU, Spatz ES, Virani SS, Blankstein R, Blaha MJ, Veledar E. Favorable cardiovascular risk factor profile is associated with lower healthcare expenditure and resource utilization among adults with diabetes mellitus free of established cardiovascular disease: 2012 Medical Expenditure Panel Survey (MEPS). *Atherosclerosis*. 2017, 258:79-83.
- [16] Burman RA. Chest pain out-of-hours. Prospective studies on diagnostics and management in out-of-hours emergency primary health care in Norway. 2015
- [17] DeMeester S. Acute cardiac disease in fielder patients. *Geriatric Emergencies: A Discussion-based Review*. 2016.
- [18] Sin NL, Kumar AD, Gehi AK, Whooley MA. Direction of association between depressive symptoms and lifestyle behaviors in patients with coronary heart disease: the Heart and Soul Study. *Annals of Behavioral Medicine*. 2016, 50(4):523-32.
- [19] Tully PJ, Cosh SM, Baumeister H. The anxious heart in whose mind? A systematic review and meta-regression of factors associated with anxiety disorder diagnosis, treatment and morbidity risk in coronary heart disease. *Journal of Psychosomatic Research*. 201, 477(6):439-48.
- [20] Alter DA, Franklin B, Ko DT, Austin PC, Lee DS, Oh PI, Stukel TA, Tu JV. Socioeconomic status, functional recovery, and long-term mortality among patients surviving acute myocardial infarction. *PloS one*. 2013, 8(6):e65130.

- [21] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*. 1983, 67(6):361-70.
- [22] Carney RM, Freedland KE. Depression in patients with coronary heart disease. *American Journal of Medicine*. 2008, 121(11): S20–S27.
- [23] Koszycki D, Lafontaine S, Frasure-Smith N, Swenson R, Lespérance F. An open-label trial of interpersonal psychotherapy in depressed patients with coronary disease. *Psychosomatics*. 2004, 45(4):319-24.
- [24] Carney RM, Freedland KE, Sheline YI, Weiss ES. Depression and coronary heart disease: a review for cardiologists. *Clinical Cardiology*. 1997; 20(3):196–200.
- [25] Milani RV, Lavie CJ. Impact of cardiac rehabilitation on depression and its associated mortality. *American Journal of Medicine*. 2007; 120(9):799–806.
- [26] Vongmany J, Hickman LD, Lewis J, Newton PJ, Phillips JL. Anxiety in chronic heart failure and the risk of increased hospitalisations and mortality: A systematic review. *European Journal of Cardiovascular Nursing*. 2016, 15(7):478-85.
- [27] Easton K, Coventry P, Lovell K, Carter LA, Deaton C. Prevalence and measurement of anxiety in samples of patients with heart failure: meta-analysis. *The Journal of cardiovascular nursing*. 2016, 31(4):367.
- [28] Haworth JE, Moniz-Cook E, Clark AL, Wang M, Waddington R, Cleland JG. Prevalence and predictors of anxiety and depression in a sample of chronic heart failure patients with left ventricular systolic dysfunction. *European journal of heart failure*. 2005, 7(5):803-8.
- [29] Katon W, Lin EH, Kroenke K. The association of depression and anxiety with medical symptom burden in patients with chronic medical illness. *General hospital psychiatry*. 2007, 29(2):147-55.
- [30] Konstam V, Moser DK, De Jong MJ. Depression and anxiety in heart failure. *Journal of cardiac failure*. 2005, 11(6):455-63.
- [31] Yohannes AM, Willgoss TG, Baldwin RC, Connolly MJ. Depression and anxiety in chronic heart failure and chronic obstructive pulmonary disease: prevalence, relevance, clinical implications and management principles. *International journal of geriatric psychiatry*. 2010, 25(12):1209-21.
- [32] Frasure-Smith N, Lespérance F, Talajic M. Depression following myocardial infarction: impact on 6-month survival. *Jama*. 1993, 270(15):1819-25.
- [33] Koenig HG, Meador MD, Cohen HJ, Blazer MD. Depression in Elderly Hospitalized Patients. *Arch Intern Med*. 1988, 148:1929-36.
- [34] Rogers AE, Addington-Hall JM, Abery AJ, McCoy AS, Bulpitt C, Coats AJ, Gibbs JS. Knowledge and communication difficulties for patients with chronic heart failure: qualitative study. *Bmj*. 2000, 321(7261):605-7.
- [35] Sarason IG, Sarason BR, Brock DM, Pierce GR. Social support: Current status, current issues. *Stress and emotion: Anxiety, anger, and curiosity*. 1996, 16:3-27.
- [36] Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *Journal of personality assessment*. 1988, 52(1):30-41.
- [37] Strik JJ, Denollet J, Lousberg R, Honig A. Comparing symptoms of depression and anxiety as predictors of cardiac events and increased health care consumption after myocardial infarction. *Journal of the American College of Cardiology*. 2003, 42(10):1801-7.
- [38] Gaziano TA, Bitton A, Anand S, Abrahams-Gessel S, Murphy A. Growing epidemic of coronary heart disease in low-and middle-income countries. *Current problems in cardiology*. 2010, 35(2):72-115.



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