

## The Relationship Between Health Literacy Level and Quality of Life in Heart Failure Patients

### ABSTRACT

**Background and Objective:** Heart failure is one of the most common cardiovascular disorders and also it is one of the main problems of general health in the current society. Considering the role of health literacy in improving the quality of life of patients, the present study was conducted to determine the health literacy status of patients with heart failure hospitalized in Shahid Mohammadi Hospital in Bandar Abbas and its relationship with quality of life in these patients.

**Materials and Methods:** This cross-sectional study was performed on 200 patients with heart failure hospitalized in Shahid Mohammadi Hospital in Bandar Abbas in 2019. Sampling was random sampling in even days of week. Data was collected by two questionnaires including standard questionnaire of health literacy and the Minnesota Quality of Life Questionnaire (MLHF). The reliability of each scale was tested by Cronbach alpha. Data were analyzed by descriptive statistics and Pearson correlation test using SPSS 21 software.

**Results:** The average level of health literacy and the quality of life were 34.60 and 79.10, respectively. Health literacy cannot be ranked as a predictor of quality of life in heart failure patients. However, a significant relationship was observed between functional, communicational and critical dimension of health literacy and mental dimension of quality of life.

**Conclusion:** Participants in our study had poor quality of life. Their health literacy also was inadequate. Although this study did not find any meaningful relationship between health literacy and quality of life, attention to improving the level of health literacy and quality of life in all dimensions in this group of patients seems necessary.

**Paper Type:** Research Article

**Keywords:** Health literacy, Heart failure, Quality of life

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#### Khadijeh Ahmadzadeh

PhD Candidate of Medical Library and Information Sciences, School of Management and Medical Information Sciences, Isfahan University of Medical Sciences, Isfahan, IR Iran.

#### Hossein Farshidi

Cardiovascular Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, IR Iran.

#### Marzieh Nikparvar

Cardiovascular Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, IR Iran.

#### Roghayeh Ezati-Rad

\*Cardiovascular Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, IR Iran. (Corresponding author).  
Ezati\_rad@yahoo.com

#### Masoomah Mahmoodi

Clinical Research Development Center of Shahid Mohammadi Hospital, Hormozgan University of Medical Sciences, Bandar Abbas, IR Iran.

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## Introduction

Congestive heart failure, which is one of the most common cardiovascular disorders and one of the major public health problems in the present-day community, has several complications that can reduce patients' quality of life. This chronic and progressive disease affects the various dimensions of the lives of heart failure patients and creates a change in their lifestyle that affects the patient's satisfaction and quality of life (1). Quality of life is one of the concepts that have been accepted in recent years as a criterion to assess the treatment outcome and patients' status with physical and mental disorders and it is as an indicator that is increasingly used as the ultimate point for treatment interventions (2). Dimensions of quality of life are: physical, social, and mental health areas that are influenced by individuals' experiences, beliefs, expectations and perceptions (3). Thus, patients' quality of life should be measured from different angles, physical, mental and social dimensions. Multiple physical and mental disorders, side effects of medicines and social constraints make people lose their previous social contacts and social activities, and lose their social relationships (4,5). Various studies have shown that these patients have lower quality of life than the general population (6). This patient also has difficulty in dealing with family and occupational problems that leading to psychological problems and depression (1). Adverse effects of the chronic disease on physical, psychological and social performance of patients are indicated by quality of life. The goal of heart failure treatment is not only to prevent disease progression and prolong life, but also relieve symptoms and improve performance (2,7).

The chronic nature of heart failure requires a long-term treatment commitment and health literacy is a key determinant of health in this area. Health literacy is the capacity of individuals to

obtain, understand and apply health information and basic health services needed to make health decisions. Health literacy enables patients to assess their health information and use them in order to make decisions about health issues, disease prevention and health promotion which lead them to improving their quality of life (8,9). Several studies have examined the relationship between health literacy and quality of life in patients with chronic diseases such as heart failure and type 2 diabetes (10-15).

Despite the high prevalence of heart failure in Iran, research has not yet explored the relationship between quality of life and the health literacy of patients with heart failure. Therefore, the present study was aimed to evaluate the health literacy status of patients with heart failure hospitalized in Shahid Mohammadi Hospital of Bandar Abbas in three areas of functional, communication and criticality and its relationship with quality of life in these patients.

## Materials and Methods

The present descriptive research was correlational and cross-sectional in type. The target population was all patients afflicted with heart failure staying more than three days in Shahid Mohammadi Hospital at the heart ward. These patients had grade 2 or higher heart failure and their disease was confirmed by a specialist. They were above 18 years of age and at the time of research, had already passed at least six months of disease. Patients with mental illness, physical disability, and a history of heart surgery in the past six months were excluded from the study. The sample size was calculated 192.

Because all questionnaires were not likely to be returned, a sample size of 200 patients with heart failure was considered which selected randomly so that during three months patients

who were hospitalized on even days of the week were included in the study. The instruments used in this research were heart failure health literacy questionnaire and Minnesota Living with Heart Failure Questionnaire to measure quality of life. The health literacy questioner consisted of 14 items at three domains: functional (5 items), communication (5 items) and critical (4 items). These items were to be rated on a Likert scale (never=1, sometimes=2, often=3, always=4). The score for each item, thus, ranged between 1 and 4 and the overall score of the scale was maximum 56. The score would range between 14 and 56. The higher the score one would receive, the higher one's level of health literacy. To prepare the Persian translated version of the scale, it was translated and retranslated by two independent qualified translators. To test the content validity of the scale, a panel of experts (n=10) was consulted. Required adaptations were made subsequently. Eventually, all items were rated for clarity, relevance and simplicity from 0 to 8.

Minnesota Living with Heart Failure Questionnaire was design by Rector in 1984. This questionnaire is the most commonly used questionnaire for heart failure patients and several studies have been carried out to measure and standardize this tool in different cultures (16). this questionnaire includes 21 items that measure the physical, psychological, and socioeconomic constraints of heart failure symptoms in the past month. Eight items related to physical aspect and physical function, and 5 items also include psychological and emotional aspects, and 7 items provide a more comprehensive examination of patients in terms of socioeconomic status. Scoring is in the Likert range, and the score 0 indicates no limitation, and 5 represents the maximum limit. The overall score varies from 0 to 105. The higher the scores of this tool, the patient will have a poorer quality of life.

To determine the face and content validity of the questionnaires, these questionnaires were presented to ten professors of Hormozgan and Bushehr University of Medical Sciences. After collecting the opinions of the professors, the desired changes were applied and its formal and content validity was confirmed. To determine the reliability questionnaires were performed by 22 patients who had the characteristics of the research sample. Cronbach's alpha coefficient was calculated for both instruments. The alpha coefficient for life quality questionnaire was calculated to be 0.91 and for health literacy 0.89. Demographic information was also collected at the same time. Questionnaire items for those who were illiterate were read by researchers and their answers were recorded. The collected data were analyzed using SPSS23 software, using descriptive statistics, independent t-test, one way ANOVA, Pearson correlation coefficient and regression analysis. The significance level in all tests is less than 0.05.

## Results

A total number of 200 patient subjects entered into study, from among whom 83 (41.5%) were female and the rest were male. One participant had not specified her gender. in terms of academic degree, 124 subjects (62%) were illiterate and only 7 (3.5%) had a university degree. 7 subjects did not mention any information about their education. The mean age of the subjects was  $64.6 \pm 16.3$  years and their age ranged between 15 and 96 years. 157 patients (78.5%) were married and the rest were single, widowed or divorced, and thus lived alone. The mean frequency of hospitalizations was  $3.6 \pm 3.3$ . The related details are provided in Table 1.

**Table 1. participants' demographic information**

Variable		Number	percent
Gender	Female	83	41.5
	Male	116	58
Marital status	Single	13	78.5
	Married	157	6.5
	Widowed/divorced	29	14.5
Education	Uneducated	124	62
	Below diploma	49	24.5
	Diploma	13	6.5
	University degree	7	3.5
Age*	<25	8	4
	25-44	16	8.1
	45-64	62	31.4
	>65	111	56.3

\*Three patients had not mentioned their age.

The mean health literacy score in terms of demographic feature is presented in Table 2 which shows that the mean health literacy was adequate. As the mean scores show, the frequency of patients with a high level of health literacy is low. The total mean score of health literacy among heart failure patients was  $34.6 \pm 5.8$  and the range of scores was 20 to 52. The mean scores for different dimensions of health literacy were respectively  $16.7 \pm 3.6$ ,  $9.5 \pm 3.7$  and  $8.4 \pm 3.3$  for functional, communicative and critical. More details have been provided in Table 2.

**Table 2. Mean and standard deviation of health literacy in study participants and its relationship with demographic characteristics**

Variable	Inadequate	Health literacy level			Mean $\pm$ SD	Min. score	Max. score	P-value
		Adequate	High					
Gender	Female	39	37	4	$34.2 \pm 6.7$	21	49	0.618
	Male	45	51	10	$35.1 \pm 5.9$	24	52	
Marital status	Single	63	71	12	$35 \pm 4.8$	24	52	0.296
	Married	8	5	0	$32.1 \pm 1.5$	21	41	
	Widowed/divorced	14	11	2	$34.9 \pm 1.4$	21	49	
Education	Uneducated	63	48	6	$33.6 \pm 5.3$	21	52	0.042
	Below diploma	16	26	3	$36.4 \pm 8.5$	28	49	
	Diploma	0	10	2	$37.9 \pm 1.1$	34	45	
	University degree	2	2	3	$39.00 \pm 3.0$	25	46	
Age*	<25	5	3	1	$32.7 \pm 1.7$	29	41	0.418
	25-44	5	4	7	$35 \pm 1.7$	29	45	
	45-64	25	31	6	$35.2 \pm 8$	21	49	
	>65	45	44	12	$34.6 \pm 5$	21	52	

Quality of life mean score which was measured by Minnesota Living with Heart Failure Questionnaire, was  $79.1 \pm 20.5$  and the scores ranged between 29 and 119. According to obtained information, patients with heart failure had gotten better score in physical

dimension and had lower score in socioeconomic dimension. More information is presented in table 3. The mean score of quality of life according demographic characteristics also has been shown in table 4.

**Table 3. Mean and standard deviation of health literacy and quality of life dimensions**

Variable		Min.	Max.	Mean	SD
Health literacy	Overall Health literacy	20	52	34.6	5.8
	Functional	5	20	16.7	3.6
	Communication	5	17	9.5	3.7
	Critical	4	16	8.4	3.3
Quality of life	Overall Quality of life	29	119	79.1	20.5
	Physical	15	49	35.2	9.0
	Mental	5	30	17.5	7.2
	socioeconomic	7	69	16.5	7.7

**Table 4. The mean score of quality of life in terms of demographic characteristics**

Variable		Min.	Max.	Mean	SD
Gender	Female	15	49	35.2	1.0
	Male	15	49	35.3	0.87
Marital Status	Married	15	49	35.3	0.75
	Single	25	45	36.1	1.9
	Widow	15	49	34.8	1.9
Education	Illiterate	15	49	35.6	0.85
	High school	17	49	36.2	1.2
	Diploma	18	49	36.6	2.3
	Academic Education	17	33	24.7	1.9

The mean score of health literacy varied significantly across different levels of education. The mean score of health literacy among the illiterate was  $33.6 \pm 5.5$  while that of subjects with a university degree was  $39 \pm 3$ . Moreover, a statistically significant correlation was found between the duration of disease and the mean health literacy score. The longer the disease, the higher one's score of health literacy ( $p = .02$ ).

Table 1 showed that in terms of sexuality, male and female had the same mean score in health literacy and there is not any significant relationship between sexuality and health literacy. Result showed that there was a significant difference between the mean score of functional dimensions of health literacy in terms of marital status ( $p = 0.002$ ).

Investigating the relationship between

mean score of quality of life and demographic characteristics showed that there was significant difference between quality-of-life mean score in terms of education ( $p = 0.028$ ) and duration of illness ( $p = 0.002$ ).

Pearson correlation test was used to examine the relation between health literacy and quality of life. Result of this test showed that health literacy cannot be ranked as a predictor of quality of life in heart failure patients. However, in the analysis of relationship between health literacy dimension and quality of life dimension, this test showed that there is a significant relationship between functional, communicational and critical dimension of health literacy and mental dimension of quality of life. For more information table 5 is provided.

**Table 5. the relationship between health literacy and quality of life and their dimensions**

Variable			Quality of life			P-value
			Physical	Mental	Socioeconomic	
Health literacy	Functional	P-value	0.093 0.203	0.155 0.033	0.065 0.383	0.91
		P-value	-0.169 0.019	-0.370 0.000	-0.185 0.012	
	Critical	P-value	-0.53 0.461	0.237 0.001	0.032 0.670	

## Discussion

This study was conducted to determine the effect of health literacy on the quality of life of patients with heart failure and related health literacy factors. Several studies have examined the relationship between health literacy and the quality of life in patients with chronic diseases such as heart failure and type 2 diabetes (9-15). But in Iran, despite the high rates of heart failure, there has not been a study on the relationship between health literacy and the quality of life in patients with heart failure.

The present study showed that about half percent of the participants in the research had adequate health literacy. These results were in line with the results of the study had been done by Naimi et al. (17), which showed that nearly half of the sample had adequate health literacy. The results of this study were inconsistent with the researches of Mahdizadeh and solhi, Solhi, and Jormand, Kajita, Kajita and Han, Tang et al. (18,19, 20, 21). This contradiction can be due to the use of different tools for measuring health literacy. The results showed that patients with less education had lower health literacy, which has been reported in other studies (22,23,24).

Previous studies have shown that a tool should be used that comprehensively measures health literacy and all aspects of health literacy. In this study, the instrument used to measure three functional, communicative and critical dimensions. The results showed that the participants in the

research achieved a higher mean score in the functional dimension which indicate patient have higher ability to understand health issues, guidelines and medical brochures. But in a communicative dimension that is ability to extract information and meanings from communicative channels, as well as critical aspects, the ability to consciously make health decisions in everyday life has gotten lower scores.

The results of this study in assessing the quality of life in patients with heart failure showed that patients with heart failure had a low quality of life. This is in line with Carels' research, which states that among chronic diseases, heart failure has the greatest impact on quality of life, as these patients have low quality of life (25). Also, the results showed that these patients have lower quality of life in physical aspect than mental and socioeconomic aspects. These results are consistent with the studies by Hobbes et al. (26), Ambriros et al. (27), Berry and McMurray (28), Jarsma et al. (29), Sasa et al (30), Jahnik et al. (10). The average quality of life variables according to the degree of education showed that people with higher education have higher quality of life. Along with this study, Mac and colleagues also showed that the lower the level of education, the quality of life is also poorer (31). Low quality of life in illiterate patients may be due to the fact that these patients are usually poor and lack of access to enough funding causes them to be deprived



of pursuing specialized health care.

The results of this study showed that there is a significant and inverse correlation between the duration of illness and quality of life. Patients experience more problems and assess their quality of life more undesirable by increasing the duration of their illness. These results are consistent with the study of Massoudi et al (32).

Contrary to the studies which have been done by Cajita, Cajita and Han (20), Macabasco et al (9), Tang et al (21), Jahnik (10) and Zheng et al (33) showed that health literacy is a strong predictor of quality of life for patients with heart failure, This study did not find any meaningful relationship between health literacy and quality of life.

**Limitations:** One of the limitations of this study is the lack of study in several centers, and therefore the limited sample volume, which reduces the possibility of generalizations. Our study was also limited to patients with heart failure admitted to a particular hospital that may affect the spiritual aspects of quality of life. Other limitations of the present study are that the researcher does not complete the questionnaire, which may affect the way of responding. So doing a similar study with a larger sample size will result in more accurate and more general findings.

## Conclusion

The results of this study showed that patients with heart failure have low quality of life, especially in physical aspect. Therefore, health care providers, including nurses, must pay particular attention to various problems especial physical, and by providing necessary area for care follow up, provide appropriate conditions in order to have desire quality of life for those patients.

**Conflicts of Interests:** No potential conflict of interest was reported by the author.

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## References

1. Paz LFD, Medeiros CdA, Martins SM, Bezerra SMMds, Oliveira Wd, Silva MBA. Quality of life related to health for heart failure patients. *Revista brasileira de enfermagem*. 2019;72:140-<https://doi.org/10.1590/0034-7167-2018-0368>
2. Nejatian M, Alami A, Tehrani H, Lael-Monfared E, Jafari A. Perceptions and personal use of Complementary and Alternative Medicine (CAM) by Iranian health care providers. *Complementary therapies in clinical practice*. 2018;32:145-50. <https://doi.org/10.1016/j.ctcp.2018.06.002>
3. Rezaee N, Seraji M. Relationship between health literacy and lifestyle in patients with heart failure. *Journal of Health Literacy*. 2018; 3(3): 174-181.
4. Kamalinedjad F, Rafiepoor A, Sabet M. Structural Equation Modeling Relationship of the between Coping Strategies with Quality of Life by mediating Lifestyle in Cardiovascular Patients. *Iranian Journal of Health Education and Health Promotion*. 2020;8(4):348-58. 43. <https://doi.org/10.29252/ijhehp.8.4.348>
5. Namazi A, Rafiey H, Mousavi M, Setareh Forouzan A, Ghaed Amini G. A systematic review of studies on the factors affecting the quality of life in the general population of Iran. *Journal of Health Literacy*. 2021;5(4):17-30.
6. Moradi M, Daneshi F, Behzadmehr R, Rafiemanesh H, Bouya S, Raeisi M. Quality of life of chronic heart failure patients: a systematic review and meta-analysis. *Heart failure reviews*. 2020;25(6):993-100 <https://doi.org/10.1007/s10741-019-09890-2>
7. Stevenson LW. Tailored therapy to hemodynamic goals for advanced heart failure. *European journal of heart failure*. 1999;1(3):251-7. [https://doi.org/10.1016/S1388-9842\(99\)00015-X](https://doi.org/10.1016/S1388-9842(99)00015-X)
8. Wu J-R, Reilly CM, Holland J, Higgins M, Clark PC, Dunbar SB. Relationship of health literacy of heart failure patients and their family members on heart failure knowledge and self-care. *Journal of family nursing*. 2017;23(1):116-37. <https://doi.org/10.1177/1074840716684808>
9. Quisenberry AJ, Scott AE, Shoben AB, Ferketich AK, Cooper SE, Berman M, et al. Health literacy and attention to cigarette health warning labels among rural smokers. *Tobacco regulatory science*. 2018;4(6):38-46. <https://doi.org/10.18001/TRS.4.6.4>
10. Kooshar H, Shoovazi M, Dalir Z, Hosseini M. Health Literacy and Health-Related Quality of Life in Older Adults with Type 2 Diabetes: The Mediating Role of Treatment Regimen Adherence.

- Journal of Health Literacy. 2021;5(4):31-40.
11. Jovanic M, Zdravkovic M, Stanisavljevic D, Jovic Vranes A. Exploring the importance of health literacy for the quality of life in patients with heart failure. *International journal of environmental research and public health*. 2018;15(8):1761. <https://doi.org/10.3390/ijerph15081761>
  12. Al Sayah F, Qiu W, Johnson JA. Health literacy and health-related quality of life in adults with type 2 diabetes: a longitudinal study. *Quality of Life Research*. 2016;25(6):1487-94. <https://doi.org/10.1007/s11136-015-1184-3>
  13. Husson O, Mols F, Fransen MP, van de Poll-Franse LV, Ezendam NP. Low subjective health literacy is associated with adverse health behaviors and worse health-related quality of life among colorectal cancer survivors: results from the profiles registry. *Psychooncology*. 2015;24(4):478-86. <https://doi.org/10.1002/pon.3678>
  14. Johnston MV, Diab ME, Kim SS, Kirshblum S. Health literacy, morbidity, and quality of life among individuals with spinal cord injury. *J Spinal Cord Med*. 2005;28(3):230-40. <https://doi.org/10.1080/10790268.2005.11753817>
  15. Lee EH, Lee YW, Moon SH. A Structural Equation Model Linking Health Literacy to Self-efficacy, Self-care Activities, and Health-related Quality of Life in Patients with Type 2 Diabetes. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2016;10(1):82-7. <https://doi.org/10.1016/j.anr.2016.01.005>
  16. Yehle KS, Plake KS, Nguyen P, Smith D. Health-related quality of life in heart failure patients with varying levels of health literacy receiving telemedicine and standardized education. *Home Healthcare Now*. 2016;34(5):267-72. <https://doi.org/10.1097/NHH.0000000000000384>
  17. Bennett SJ, Oldridge NB, Eckert GJ, Embree JL, Browning S, Hou N, et al. Discriminant properties of commonly used quality of life measures in heart failure. *Quality of life research*. 2002;11(4):349-59. <https://doi.org/10.1023/A:1015547713061>
  18. Naimi AJ, Naderiravesh N, Bayat ZS, Shakeri N, Matbouei M. Correlation between health literacy and health-related quality of life in patients with hypertension, in Tehran, Iran, 2015-2016. *Electronic physician*. 2017;9(11):5712. <https://doi.org/10.19082/5712>
  19. Mahdizadeh M, Solhi M. Relationship between self-care behaviors and health literacy among elderly women in Iran, 2015. *Electronic physician*. 2018;10(3):6462. <https://doi.org/10.19082/6462>
  20. Solhi M, Jormand H, Gohari MR. The Impact of Media Literacy Intervention on the Female Students' Attitudes about Self-Medication of Slimming Supplements. *Journal of Health Literacy*. 2016;1(1):13-24.
  21. Cajita MI, Cajita TR, Han H-R. Health literacy and heart failure: a systematic review. *The Journal of cardiovascular nursing*. 2016;31(2):121. <https://doi.org/10.1097/JCN.0000000000000229>
  22. Tung H-H, Lu T-M, Chen L-K, Liang S-Y, Wu S-F, Chu K-H. Health literacy impact on elderly patients with heart failure in Taiwan. *Journal of Clinical Gerontology and Geriatrics*. 2014;5(3):72-6. <https://doi.org/10.1016/j.jcgg.2014.01.005>
  23. Reisi M, Mostafavi F, Javadzade H, Mahaki B, Tavassoli E, Sharifirad G. Communicative and critical health literacy and self-care behaviors in patients with type 2 diabetes. *Iranian journal of Diabetes and Metabolism*. 2015;14(3):199-208.
  24. Kutner M, Greenburg E, Jin Y, Paulsen C. *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy*. NCES 2006-483. National Center for Education Statistics. 2006 Sep.
  25. Cho YI, Lee S-YD, Arozullah AM, Crittenden KS. Effects of health literacy on health status and health service utilization amongst the elderly. *Social science & medicine*. 2008;66(8):1809-16. <https://doi.org/10.1016/j.socscimed.2008.01.003>
  26. Carels RA. The association between disease severity, functional status, depression and daily quality of life in congestive heart failure patients. *Quality of life research*. 2004;13(1):63-72. <https://doi.org/10.1023/B:QURE.0000015301.58054.51>
  27. Hobbs F, Kenkre J, Roalfe A, Davis R, Hare R, Davies M. Impact of heart failure and left ventricular systolic dysfunction on quality of life. A cross-sectional study comparing common chronic cardiac and medical disorders and a representative adult population. *European heart journal*. 2002;23(23):1867-76. <https://doi.org/10.1053/euhj.2002.3255>
  28. Ambrosy AP, Fonarow GC, Butler J, Chioncel O, Greene SJ, Vaduganathan M, et al. The global health and economic burden of hospitalizations for heart failure: lessons learned from hospitalized heart failure registries. *Journal of the American College of Cardiology*. 2014;63(12):1123-33. <https://doi.org/10.1016/j.jacc.2013.11.053>
  29. Berry C, McMurray J. A review of quality-of-life evaluations in patients with congestive heart failure. *Pharmacoeconomics*. 1999;16(3):247-71. <https://doi.org/10.2165/00019053-199916030-00003>
  30. Ponikowski P, Anker SD, AlHabib KF, Cowie MR, Force TL, Hu S, et al. Heart failure: preventing disease and death worldwide. *ESC Heart Failure*. 2014;1(1):4-25. [10.1002/ehf2.12005](https://doi.org/10.1002/ehf2.12005)
  31. Marques de Sousa M, dos Santos Oliveira J, Oliveira Soares MJG, Amorim de Araújo A, dos Santos Oliveira SH. Quality of life of patients with heart failure: integrative review. *Journal of Nursing UFPE/Revista de Enfermagem UFPE*. 2017;11(3). 10.5205/reuol.
  32. Meeks S, Murrell SA. Contribution of education to health and life satisfaction in older adults mediated by negative affect. *Journal of Aging and Health*. 2001;13(1):92-119. <https://doi.org/10.1177/089826430101300105>
  33. Masoudi FA, Rumsfeld JS, Havranek EP, House JA, Peterson ED, Krumholz HM, et al. Age, functional capacity, and health-related quality of life in patients with heart failure. *Journal of cardiac failure*. 2004;10(5):368-73. <https://doi.org/10.1016/j.cardfail.2004.01.009>
  34. Zheng M, Jin H, Shi N, Duan C, Wang D, Yu X, et al. The relationship between health literacy and quality of life: a systematic review and meta-analysis. *Health and quality of life outcomes*. 2018;16(1):1-10. <https://doi.org/10.1186/s12955-018-1031-7>