

## ORIGINAL ARTICLE

## QUALITY OF LIFE IN PATIENTS WITH CORONARY ARTERY DISEASE: A PROSPECTIVE STUDY

Hanady Jabbar Mahmood<sup>1\*</sup>, Saad Hussein Murad<sup>1</sup>, Muhanned Khaleel Abdullah<sup>1</sup> and Radhwan Hussein Ibrahim<sup>2</sup>

<sup>1</sup>Department of Clinical Nursing Sciences, College of Nursing, University of Mosul, City of Mosul, Iraq

<sup>2</sup>Department of Clinical Nursing Sciences, College of Nursing, Ninevah University, City of Mosul, Iraq

Corresponding author: Hanady Jabbar Mahmood

Email: [hanady.jabar@uomosul.edu.iq](mailto:hanady.jabar@uomosul.edu.iq); [hanadynursing@gmail.com](mailto:hanadynursing@gmail.com)

## ABSTRACT

The objective of the current study is to compare patients' Quality of life with myocardial infarction (MI) and angina pectoris (AP). In a cross-sectional study, 351 people who had been diagnosed with coronary artery disease in 2021 were selected. The QoL, SF-36, and information sheet were employed in this research. Univariate and bivariate binary Logistic Regression was used to analyse the data. Preliminary results show that concerning age, the average was in the AP group and the MI group ( $40.5 \pm 0.2$ ), ( $52.6 \pm 0.3$ ), respectively. Women constituted the highest percentage (57%) in the two groups. Most of the study participants have low education (57%) and are married (92%). In the invariable logistic regression analysis, ORs were higher among patients belonging to the age group  $\geq 65$  in the AP (OR, 4.11; 95% CI, (2.59-4.14);  $P = 0.001$ ) and the MI group (OR, 7.18; 95% CI, (5.74-8.97);  $P < 0.001$ ). Patients' Quality of life suffers significantly after a cardiac attack, particularly in the early stages of recovery. While significant life improvements have been made over time, physicians working with cardiac patients face difficulty due to residual discomfort after a year's follow-up.

**Keywords:** Cardiovascular, Myocardial, infarction, quality of life, QOLIE-36.

## INTRODUCTION

Cardiovascular diseases (CVD) have shown a significant prevalence in morbidity and mortality in most developed and developing countries, including Iraq and Middle East. Among the CVD, coronary artery disease stands out as a significant cause of death and disability in the occurrence of its clinical manifestations: myocardial infarction (MI), angina pectoris (AP), and sudden death<sup>1</sup>. In addition to mortality and morbidity as an indicator of treatment outcomes for patients with chronic diseases, Quality of life (QoL) has become an important variable that has been widely considered in recent times<sup>2</sup>. The interest of researchers in transforming the concept of Quality of life into a quantitative measure to be used in clinical trials and economic models is growing so that it can be compared between different populations and pathologies<sup>3, 4</sup>. Quality of life is an abstract concept that is highly subjective and is influenced by personal and cultural values, beliefs, self-concepts, goals, age, and life expectancy<sup>5</sup>. The importance of assessing QoL with CVD patients has been confirmed by the wide use of different instruments that allow its measurement in different areas of the health system<sup>6</sup>. Live experiences such as illnesses, treatments, interpersonal relationships, and social support also influence the Quality of life. The instruments that aim to measure QoL seek to include questions that address physical, emotional, and social functions, role performance, pain, sleep, and specific symptoms

of the diseases<sup>3, 7</sup>. More recently, QoL has emerged as an important feature of nursing care, which is designed to take into account patients' feelings and satisfaction with treatment along with the traditional focus on disease outcomes. Considering that infarction and angina may have different repercussions on the subject's life, the present study aimed to compare QoL measures between two groups of patients with coronary artery disease: with a history of myocardial infarction (MI) and angina pectoris (AP).

## METHODS

This was a non-experimental and descriptive study. The subjects of this study included (351) patients with CVD along with a history of clinical manifestations of (185) MI and (166) PA treated at the Cardiology Ambulatory, sub-speciality of ischemic heart disease of Ibn Sina Teaching Hospital and Alsalam Teaching Hospital who met the following criteria: the ability to understand and communicate verbally and agreement to participate in the research, which was made official by signing the Free and Informed Consent Term (FICT). It is noteworthy that the standard of care was not changed for the study.

## Data collection

Sociodemographic data: An information sheet was used to collect sociodemographic data such as age, gender, and Time since Diagnosis.

QoL: The SF-36 Questionnaire, version II<sup>8</sup> was used to assess the Quality of life. This Questionnaire has two dimensions: Physical

Health and Mental Health. These dimensions are, in turn, divided into four subscales. The component subscales of the Physical Health dimension are a) Physical Function (PF), b) Physical Role (PR), c) Pain (P), and d) General Health (GH). The component subscales of the Mental Health dimension are a) Mental Health, b) Emotional Role (ER), c) Social Function (SF), and d) Vitality (V). In general, the reliability of the SF-36 has been tested using internal consistency methods. Test-retest and the coefficients have ranged between 0.70 and 0.80, although several have exceeded 0.80<sup>8</sup>. In the case of validity, it has been found that in various studies, the eight subscales of the SF-36 have yielded evidence of criterion, content, concurrent, and construct validity and have been used in populations ranging from 14 years old to older adults. *Disease severity*: This was assessed according to the New York Heart Association (NYHA) classification<sup>9</sup> at T1 (just after diagnosis). This NYHA classification indicates the severity of cardiac symptoms and may range from 1 (mild symptoms) to 4 (severe symptoms).

**Statistical analysis**

The statistical tests were conducted assuming that the values were normally distributed. The data is obtained through the use of questionnaires that were transferred to the SPSS software, System for Windows, version 26 for the following analyses: Descriptive (frequency, percentages mean, and Standard Deviation), and Logistic Regression. P values of 0.05 were considered as statistically significant.

**Study limitations**

Since the current research was cross-sectional and gathered data at a single moment in time,

no conclusions or changes over time were possible. Cross-sectional research cannot establish a causal relationship between quality of life and sociodemographic or clinical factors. Another possible restriction is categorising patients according to their educational level using a cut-off threshold of up to 9 years of schooling. Categorising patients in a different method may likely lead to various outcomes. Finally, the low response rate restricts the capacity to extend the outcomes of this research to the overall demographic group.

**RESULTS**

Preliminary result shows that the average age was 40.5 ± 0.2 and 52.6 ± 0.3 in the AP and MI groups, respectively. Women constituted the highest percentage (57%) in both groups. Most of the study participants had low education (57%) and were married (92%). Most participants admitted that they smoke and are not engaged in physical activities. Comorbidity like hypertension was high (22%) in the AP group and (27%) in the MI, while diabetes was 29.2% in AP and 34% in MI patients. The psychological problem appeared in both groups with (17%) symptoms of depression (refer Table No. 1). In the invariable logistic regression analysis, ORs were higher among patients belonging to age bracket (≥ 65) in the AP (OR, 4.11; 95% CI, (2.59-4.14); P= 0.001) and in the MI group (OR, 7.18; 95% CI, (5.74-8.97); P< 0.001). ORs were higher among women in the AP group (OR, 2.93; 95% CI, 2.24-3.83; P= 0.001) and in the MI group (OR, 4.63; 95% CI, (3.56-6.02); P< 0.001) (refer Table 2).

Table 1a: Characteristics of the study sample

Variable	AP Group 185		MI Group 166		Total 351	
	F	%	F	%	F	%
<b>Age (y)</b>	40.5 ±0.2		52.6 ± 0.3			
30-44	20	10.8	13	7.8	33	9
45-64	82	44.3	58	35	140	40
≥ 65	83	44.9	95	57.2	178	51
Total	185	100	166	100	351	100
<b>Gender</b>	F	%	F	%	F	%
Men	85	46	65	39	150	43
Women	100	54	101	61	201	57
Total	185	100	166	100	351	100
<b>Education level</b>	F	%	F	%	F	%
Low education	94	51	106	64	200	57
Middle school	68	37	50	30	118	34
University	23	12	10	6	33	9
Total	185	100	166	100	351	100
<b>Marital status</b>	F	%	F	%	F	%
Married	168	91	156	94	324	92
Unmarried	17	9	10	6	27	8
Total	185	100	166	100	351	100

Table 1b: Characteristics of the study sample

<b>Current smoker</b>	128	69	101	61	229	85
Non	57	31	65	39	122	35
Total	185	100	166	100	351	100
<b>Physical activity</b>	F	%	F	%	F	%
No exercise	93	50	106	64	199	57
Low-intensity	48	26	41	25	89	25
Moderate to vigorous-intensity	44	24	19	11	63	18
Total	185	100	166	100	351	100
<b>Comorbidity*</b>	F	%	F	%	F	%
HT	41	22.2	45	27	86	25
DM	54	29.2	56	34	110	31
Dyslipidemia	60	32.4	36	22	96	27
Depression	30	16.2	29	17	59	17
Total	185	100	166	100	351	100
<b>Body mass index (kg/m<sup>2</sup>)</b>	24.2 ±0.1		24.5 ± 0.1			

Table 2a: Unavailable logistic regression analysis to assess the relationship between impaired QoL\* and demographic or clinical factors

Variable	AP Group		MI Group	
	Unadjusted OR (95% CI)	P-value	Unadjusted OR (95% CI)	P-value
<b>Age (y)</b>				
30-44	Reference		Reference	
45-64	1.39 (1.19-1.85)	< 0.001	1.87 (1.56-2.24)	< 0.001
≥ 65	4.11 (2.59-4.14)	< 0.001	7.18 (5.74-8.97)	< 0.001
<b>Gender</b>				
Men	Reference		Reference	
Women	2.93 (2.24-3.83)	< 0.001	4.63 (3.56-6.02)	< 0.001
<b>Education level</b>				
High education	Reference		Reference	< 0.001
Middle education	1.29 (1.04-1.61)	0.02	1.31 (1.02-1.68)	
Low education	3.24 (2.54-4.14)	< 0.001	5.22 (4.16-6.55)	0.04
<b>Unemployed status</b>	2.64 (2.13-3.27)	< 0.001	1.47 (1.28-1.73)	< 0.001
<b>Marital status</b>				
Married	Reference		Reference	
Unmarried	1.56 (1.01-2.40)	0.04	3.05 (2.50-3.71)	< 0.001
<b>Current smoker</b>	1.16 (0.98-1.38)	0.08	1.68 (1.22-2.30)	0.001
<b>Physical activity</b>				
Moderate to vigorous-intensity	Reference		Reference	
Low-intensity	1.01 (0.77-1.32)	0.94	1.04 (0.80-1.35)	0.79
No exercise	1.19 (0.95-1.49)	0.13	1.34 (1.05-1.69)	0.02
<b>Mental Health</b>	2.19 (1.84-2.61)	< 0.001	2.81 (2.40-3.30)	< 0.001
<b>Comorbidities†</b>				
Hypertension	1.79 (1.49-2.16)	< 0.001	2.91 (2.41-3.51)	< 0.001
Diabetes mellitus	1.46 (1.17-1.81)	0.001	2.09 (1.63-2.66)	< 0.001
Dyslipidemia	1.79 (1.37-2.32)	< 0.001	1.98 (1.55-2.53)	< 0.001

**Table 2b: Unavailable logistic regression analysis to assess the relationship between impaired QoL\* and demographic or clinical factors**

Depression	4.96 (2.86-8.60)	< 0.001	3.50 (2.55-4.81)	< 0.001
<b>Body mass index (kg/m<sup>2</sup>)</b>				
18.5-22.9	Reference		Reference	
< 18.5	1.25 (0.72-2.16)	0.43	1.57 (1.07-2.30)	0.02
23-24.9	0.89 (0.71-1.13)	0.33	1.18 (0.94-1.48)	0.17
≥ 25	0.93 (0.74-1.16)	0.5	1.55 (1.28-1.89)	< 0.001
<b>5-Year cardiovascular disease risk</b>				
< 5.0%	Reference		Reference	
5%-9.9%	1.42 (1.13-1.78)	0.002	3.10 (2.53-3.79)	< 0.001
≥ 10.0%	2.38 (1.95-2.91)	< 0.001	5.14 (3.85-6.87)	< 0.001

**Table 3: Mean Scores obtained in each Domain of QoL.SF-36 Questionnaire**

Dimension	AP group (Mean +SD)	MI Group(Mean +SD)	Both group
Functional capacity	23.8 ±12.1	61.9±22.3	61.9±24.1
Physical	42.6±10.7	49.4±19.4	48.9±18.1
Pain	45.6±14.8	49.4±10.6	31.1±17.2
General health	41.5±29.1	44.8±19.4	43.9±11.2
Vitality	40.3±10.9	40±12.3	40.2±14.1
Social	56.9±15.6	45.9±14.6	45.8±17.3
Emotional	45.5±16.7	61.7±15.7	61.4±16.3
Mental health	61.2±9.8	47.3±14.9	47.2±10.1

**DISCUSSION**

Although there is a universal agreement that quality of life is an important factor in cardiovascular disease, there is also substantial scepticism regarding the possibility that it can be quantified in any meaningful way. Many attempts to evaluate the quality of life have been based on conceptual and psychometrically insufficient measures that fail to encompass the entire impact that heart disease and its treatment have on the lives of patients and their families. These measures have been used in many failed attempts. On the other hand, there has been an increase in the number of standard measures covering a broad range of aspects related to the quality of life as well as an impressive body of knowledge concerning the methodologies of generic and specific measures including the methods by which they should be derived and applied. The quality of life in patients with cardiovascular disease can be evaluated in terms of what is expected and what is feasible. The

data reported in this study did not show statistically significant differences in QoL measures in the eight dimensions of the SF-36 between the studied groups: IM and AP (refer Table 3).

However, the scores that were observed reflect the findings of the research that was performed on the measurement of QoL in patients who had cardiovascular disease (CVD), demonstrating poor scores in most of the aspects that were analysed.<sup>10-16</sup> Similar work was also carried out by using an SF36v2 Questionnaire and the Quality of life of the subjects was assessed in 11 dimensions<sup>17</sup>. It was found that the highest Quality of life was in the limited activity due to emotional problems (RE) dimension, social functioning (SF), and physical functioning (PF); the weakest scores were observed in vitality (VT), general health perception (GH), and health transition (HT) dimensions (refer Table 4).

Table 4: Multivariable logistic regression analysis to assess the relationship between impaired QoL\* and the QoL dimensions

Impaired QoL	QoL dimensions							
	Functional capacity	Physical	Pain	GH	Vitality	Social	Emotional	Mental
<b>10-Year cardiovascular disease risk ( AP)</b>								
< 5.0%	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
5.0%-9.9%	1.21 (0.94-1.57)	2.07 <sup>†</sup> (1.31-3.29)	2.69 (0.99-7.31)	1.67 (0.90-3.11)	1.03 (0.76-1.39)	1.67 (1.11-2.53)	2.16 <sup>†</sup> (1.31-3.29)	2.88 (0.97-7.33)
≥ 10.0%	1.62 <sup>‡</sup> (1.24-2.11)	3.15 <sup>‡</sup> (2.02-4.90)	2.23 (0.68-7.28)	1.70 (0.87-3.33)	1.16 (0.86-1.58)	1.50 <sup>†</sup> (0.92-2.45)	3.15 <sup>‡</sup> (2.16-3.99)	2.11 (0.66-7.21)
<b>10-Year cardiovascular disease risk ( MI)</b>								
< 5%	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
5%-9.9%	1.25 (0.98-1.60)	1.33 <sup>†</sup> (1.01-1.75)	1.55 (0.89-2.69)	1.40 (0.98-2.01)	1.32 <sup>†</sup> (1.03-1.69)	0.83 (0.60-1.15)	2.19 <sup>†</sup> (1.31-3.29)	2.71 (0.95-7.47)
≥ 10.0%	1.46 <sup>†</sup> (1.02-2.08)	1.56 <sup>†</sup> (1.09-2.24)	2.14 <sup>†</sup> (1.09-4.22)	1.80 <sup>‡</sup> (1.17-2.78)	1.08 (0.77-1.52)	0.75 (0.45-1.25)	3.15 <sup>‡</sup> (2.19-3.89)	2.62 (0.64-7.25)

The respondents functioned somewhat better in the mental dimension (MCS) than physically (PCS). In the studies on the Quality of life with the SF36v2 Questionnaire, other authors concluded that within the population of people aged above 50 years, the best Quality of life was in the physical fitness (PF) and general health perceptions (GH) dimensions<sup>18-22</sup>.

Considering sociodemographic characteristics of CVD patients, a negative relationship was observed between factors such as female gender, increased age, lower educational level, and QoL. The Quality of life according to gender was significantly higher in males than in females<sup>23-25</sup>. The scores in all eight domains were found higher in males. It was observed that physical function and vitality were low, particularly in women, which was supported by Pocock et al., who also reported the same, mentioning increased age of women being the reason for a low score. Considering mental health in our study, both men and women showed the lowest mental health scores for all subjects as supported by Conn v. et al. and subjects were suggested to perform interventions that strengthen their mental health to improve their Quality of life<sup>27</sup>.

The data in the current study shows that women showed more social support than men. In contrast to it, a study conducted by Jeong J. et al. revealed that men showed higher social support than women, stating that men enjoy social and economic life as compared to the women<sup>23-27</sup>.

In terms of the differences in depression according to gender, women reported having significantly higher depression scores and stress than men, which was supported by the present study stating the same<sup>28, 29</sup>. Conversely, Sokol RS et.al revealed that women are more tolerant of expressing anxiety or depression than men<sup>30</sup>. The role of sex has been considered as an influential factor in most of the investigated studies. Some of them showed a significant relationship between sex and patients' Quality of life<sup>31-33</sup>. Despite this significant relationship between sex and Quality of life observed in most studies, there was no significant relationship between sex and Quality of life in some studies.<sup>34, 35</sup>

It is observed that from the investigation of the disease and its manifestations, the type of therapeutic approach, and the rehabilitation processes, women are always at a disadvantage over men, being enrolled less frequently in programs of rehabilitation or receiving a lower proportion of aggressive drug/invasive therapies. For the association between level of education and QoL, the study finding shows that patients with a low level of education compared with a high educational level have a significantly lower

score; this gap is also clinically relevant<sup>36</sup>. This finding applies to the whole sample.

As mentioned in other studies, lower QoL scores for female patients compared with male patients in both educational groups were detected in our analysis<sup>37, 38</sup>.

The present study also concludes that subjects having employment showed better scores than unemployed ones. This is a significant finding out of all the subjects interviewed, and 71.1% reported some changes in their work activity due to the manifestation of the disease. More than half of the group (56.6% = 43/76) was inactive, and out of these, 44.7% attributed inactivity to the disease<sup>31, 39,40</sup>. The present study also showed a positive association between the sum of controlled risk factors and HRQoL measured with the EQ-5D score. This is supported by Cacoub et al<sup>41</sup> who have shown that improved risk factor control is associated with a positive impact on 3-year cardiovascular event rates and mortality<sup>42</sup>.

The time elapsed since the manifestation of the disease was negatively associated with the functional capacity domain. Thus, the subjects with the longest time of manifestation had a lower score in this domain. It would be interesting to investigate in future studies whether there is a reproduction of this finding with an increase in the sample size with variable parameters. It can be concluded that symptoms of CVD in addition to limiting the subjects' daily activities may also evoke the possibility of the manifestation of a new ischemic event. Longitudinal studies should also be encouraged to assess whether interventions specifically aimed at addressing these variables result in an improvement in the QoL of these subjects. The associated use of disease-specific QoL measurement instruments should also be considered since they have a clinical sensitivity and greater power to detect changes in QoL in response to specific clinical interventions, thereby obtaining a generic and specific assessment of the disease.

## CONCLUSION

The data from the current study allowed us to conclude that there was no statistically significant difference between the measures of QoL performed using the generic instrument SF-36 for the IM and AP groups. However, the variables: gender, type of employment, the time elapsed since the onset of the disease, and the presence of symptoms (angina, arrhythmia, and fatigue) were associated with lower scores on QoL measures in different dimensions. Future studies should be conducted to expand the sample size and understand the magnitude of the effect of the highlighted variables on the QoL of subjects with coronary artery disease.

The close relationship between quality of life and all clinical cases is still of interest to researchers. In the fields of cardiology and chronic disease care, the concept of quality of life remains of high importance. The relentless pursuit of treatment is set aside to instead meet the patient's goals and increase the patient's quality of life. Studies are still showing the difference between individuals concerning the impact of diseases on their quality of life with each passing day. Therefore, it is important to note that assessing the quality of life by a limited definition or application of a specific model to all patients would be wrong as in the literature.

## ACKNOWLEDGEMENT

We want to thank the ethical Research committee in the City of Mosul Health Directorate and the Deanship of Nursing College at the University of Mosul for facilitating the current research process.

## Conflict of interest

The authors declare no potential conflict of interest.

## Ethical considerations compliance with ethical guidelines

Ethical permission was obtained from the Nineveh Medical Ethics Committee (NMEC) with letter No. 668 dated 14<sup>th</sup> June 2021. The participants were informed about the research's purpose and ensured anonymity and confidentiality. A written informed, voluntary participation consent was obtained from each participant.

## Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

## Author's contributions

Study concept: Hanady Jabbar and Saad Hussein; Writing the original draft: Hanady Jabbar, Mohammed Khaleel, and Radhwan Hussein; Data collection: Hanady Jabbar; Data analysis: Mohannad Khaleel; Reviewing the final edition: All authors.

## REFERENCES

- Şahin B, İlgün G. Risk factors of deaths related to cardiovascular diseases in World Health Organization (WHO) member countries. *Health & Social Care in the Community*. 2022;30(1):73-80.
- Molania T, MalekzadehShafaroudi A, Taghavi M, Ehsani H, Moosazadeh M, Haddadi A, et al. Oral health-related quality of life (OHRQoL) in cardiovascular patients referring to Fatima Zahra Hospital in Sari, Iran. *BMC Oral Health*. 2021;21(1):1-9.
- Phyo AZZ, Ryan J, Gonzalez-Chica DA, Stocks NP, Reid CM, Tonkin AM, et al. Health-related Quality of life and incident cardiovascular disease events in community-dwelling older people: A prospective cohort study. *International Journal of Cardiology*. 2021;339:170-8.
- Cao N, Hao Z, Niu L, Zhang N, Zhu H, Bao H, et al. The Impact of Risk Factor Control on Health-Related Quality of Life in Individuals with High Cardiovascular Disease Risk: A Cross-sectional Study Based on EQ-5D Utility Scores in Inner Mongolia, China. *Journal of Epidemiology and Global Health*. 2022:1-10.
- Pinheiro LC, Reshetnyak E, Sterling MR, Richman JS, Kern LM, Safford MM. Using health-related Quality of life to predict cardiovascular disease events. *Quality of Life Research*. 2019;28(6):1465-75.
- Ko H-Y, Lee J-K, Shin J-Y, Jo E. Health-related quality of life and cardiovascular disease risk in Korean adults. *Korean Journal of family medicine*. 2015;36(6):349.
- Todorova M. Participation of the nurse in the prevention of patients with CVD through health education and monitoring of health related Quality of life. *European Journal of Cardiovascular Nursing*. 2021;20(Supplement\_1):zvab060. 107.
- Saris-Baglana RN, Dewey CJ, Chisholm GB, Plumb E, King J, Kosinski M, et al. *QualityMetric health outcomes™ scoring software 4.0: installation guide*. Lincoln (RI): QualityMetric Incorporated. 2010.
- Fisher JD. New York heart association classification. *Archives of internal medicine*. 1972;129(5):836-.
- Kovacs FM, Abaira V, Zamora J, del Real MTG, Llobera J, Fernández C. Correlation between pain, disability, and Quality of life in patients with common low back pain. *Spine*. 2004;29(2):206-10.
- Horng Y-S, Hwang Y-H, Wu H-C, Liang H-W, Mhe YJ, Twu F-C, et al. Predicting health-related Quality of life in patients with low back pain. *Spine*. 2005;30(5):551-5.
- Tavafian SS, Jamshidi A, Mohammad K, Montazeri A. Low back pain education and short term quality of life: a randomized

- trial. *BMC musculoskeletal disorders*. 2007;8(1):1-6.
13. Pellisé F, Balagué F, Rajmil L, Cedraschi C, Aguirre M, Fontecha CG, et al. Prevalence of low back pain and its effect on health-related Quality of life in adolescents. *Archives of pediatrics & adolescent medicine*. 2009;163(1):65-71.
  14. Tran PQ, Nguyen NTY, Nguyen B, Bui QTH. Quality of life assessment in patients on chronic dialysis: Comparison between haemodialysis and peritoneal dialysis at a national hospital in Vietnam. *Tropical Medicine & International Health*. 2022.
  15. Cheng J, Yang D, Zuo Q, Peng W, Zhu L, Jiang X. Correlations between uncertainty in illness and anxiety, depression and Quality of life in patients receiving maintenance haemodialysis: A cross-sectional study. *Nursing Open*. 2022.
  16. Qader MA, Mottaleb AA, Shetu NA, Khan RS, Nisha TA. Physical Health Versus Mental Health in Haemodialysis Patient: Assessment of Health-Related Quality of Life-A Single Centre Experience. *Bangladesh Journal of Medical Science*. 2022;21(1):90-5.
  17. Sygit K, Siedlecka-Pasierbiak K, Sygit M, Cipora E. The Quality of life of seniors hospitalized due to cardiovascular diseases in Poland. *International Journal of Environmental Research and Public Health*. 2020;17(10):3721.
  18. Wang R, Wu C, Zhao Y, Yan X, Ma X, Wu M, et al. Health related quality of life measured by SF-36: a population-based study in Shanghai, China. *BMC public health*. 2008;8(1):1-8.
  19. Hopman WM, Towheed T, Anastassiades T, Tenenhouse A, Poliquin S, Berger C, et al. Canadian normative data for the SF-36 health survey. *Cmaj*. 2000;163(3):265-71.
  20. CarvalhoMVd, Siqueira LB, Sousa ALL, Jardim PCBV. The influence of hypertension on quality of life. *Arquivosbrasileiros de cardiologia*. 2013;100:164-74.
  21. Liu R, Wu S, Hao Y, Gu J, Fang J, Cai N, et al. The Chinese version of the world health organization quality of life instrument-older adults module (WHOQOL-OLD): psychometric evaluation. *Health and Quality of Life Outcomes*. 2013;11(1):1-8.
  22. Lam CL, Eileen Y, Gandek B, Fong DY. The SF-36 summary scales were valid, reliable, and equivalent in a Chinese population. *Journal of clinical epidemiology*. 2005;58(8):815-22.
  23. Emery CF, Frid DJ, Engebretson TO, Alonzo AA, Fish A, Ferketich AK, et al. Gender differences in Quality of life among cardiac patients. *Psychosomatic medicine*. 2004;66(2):190-7.
  24. Lee J. Health-related Quality of life in patients after coronary artery bypass graft. Unpublished master's thesis, University of Ulsan, Ulsan, Korea. 2004.
  25. Jeong J. A study on social support and Quality of life in patients underwent coronary artery bypass graft surgery. Unpublished master's thesis, Hanyang University, Seoul. 2007.
  26. Pocock SJ, Henderson RA, Clayton T, Lyman GH, Chamberlain DA, Participants R-T. Quality of life after coronary angioplasty or continued medical treatment for angina: three-year follow-up in the RITA-2 trial. *Journal of the American College of Cardiology*. 2000;35(4):907-14.
  27. Conn V, Taylor SG, Abele PB. Myocardial infarction survivors: age and gender differences in physical health, psychosocial state and regimen adherence. *Journal of advanced nursing*. 1991;16(9):1026-34.
  28. Koh S-B, Chang S-J, Kang M-G, Cha B-S, Park J-K. Reliability and validity on measurement instrument for health status assessment in occupational workers. *Journal of Preventive Medicine and Public Health*. 1997;30(2):251-66.
  29. Shin S. A study on the gender difference of health status on the recovery state after CABG (Coronary Artery Bypass Surgery). Unpublished master's thesis, EwhaWomans University, Seoul. 1999.
  30. Sokol RS, Folks DG, Herrick RW, Freeman AM. Psychiatric outcome in men and women after coronary bypass surgery. *Psychosomatics: Journal of Consultation and Liaison Psychiatry*. 1987.
  31. Esmaili Z, ZiabakhshTabari S, Vazezadeh N. Investigation of Quality of life after open heart surgery in Sari. *Journal of Mazandaran University of Medical Sciences*. 2007;17(61):170-4.



32. Taghipour H, Naseri M, Safiarian R, Dadjoo Y, Pishgoo B, Mohebbi H, et al. Quality of life one year after coronary artery bypass graft surgery. *Iranian Red Crescent Medical Journal*. 2011;13(3):171.
33. Hatmi Z, Kazemi MSM. Quality of life in patients hospitalized with heart failure: A novel two questionnaire study. *ActaMedicaliranica*. 2007:493-500.
34. HasanPour-Dehkordi A, Delaram M, Foruzandeh N, Ganji F, Bakhsha F, Sadegi B. A survey on Quality of life in patients with myocardial infarction, referred to Shahrekord Hagar hospital in 2005. *Journal of ShahrekordUuniversity of Medical Sciences*. 2007;9.
35. HasanPour-Dehkordi A, Nazari AA, Forouzandeh N, Kasiri K, Masoudi R, Mousavi A. Factors influencing Quality of life in patients with myocardial infarction. *Iran Journal of Nursing (IJN)*. 2009;22(57).
36. Ware Jr JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical care*. 1992:473-83.
37. Montazeri A, GOSHTASBI A, Vahdaninia M. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. 2006.
38. Jaagosild P, Dawson NV, Thomas C, Wenger NS, Tsevat J, Knaus WA, et al. Outcomes of acute exacerbation of severe congestive heart failure: Quality of life, resource use, and survival. *Archives of internal medicine*. 1998;158(10):1081-9.
39. Yousefi P, Sabzevari S, Mohammadalizade S, Haghdoost A. Study of Quality of life in heart failure hospitalized patients in Kerman medical university hospital in 2008. 2011.
40. Rahnavard Z, Zolfaghari M, Kazemnejad A, Hatamipour K. An investigation of Quality of life and factors affecting it in the patients with congestive heart failure. *Journal of hayat*. 2006;12(1):77-86.
41. Marcellin P, Chousterman M, Fontanges T, Ouzan D, Rotily M, Varastet M, et al. Adherence to treatment and Quality of life during hepatitis C therapy: a prospective, real-life, observational study. *Liver International*. 2011;31(4):516-24.
42. Cacoub PP, Zeymer U, Limbourg T, Baumgartner I, Poldermans D, Röther J, et al. Effects of adherence to guidelines for the control of major cardiovascular risk factors on outcomes in the Reduction of Atherothrombosis for Continued Health (REACH) Registry Europe. *Heart*. 2011;97(8):660-7.