

# Quality of Life for Cardiovascular patients in Riyadh, Saudi Arabia

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## ABSTRACT

Cardiovascular diseases are the main cause of death throughout the worldwide. improving the quality of life of these patients is one of the most important things that must be taken into consideration to improve their health outcomes. The aim of this study was to assess the quality of life for patients diagnosed with cardiovascular diseases in Saudi Arabia. This is an online observational cross-sectional survey study that was conducted in Saudi Arabia between January and February 2025. A previously validated tool was adopted in this research to examine participants quality of life. The Analysis of Variance (ANOVA) test and the independent t-test were performed to examine the difference in continuous variables. The sample consists of 275 males (70.2%) and 117 females (29.8%). The reliability analysis of the SF-36 questionnaire demonstrated strong internal consistency across most domains. In details, physical functioning had excellent reliability (Cronbach  $\alpha = 0.91$ ), while role functioning (physical  $\alpha = 0.89$ , emotional  $\alpha = 0.90$ ) and pain ( $\alpha = 0.83$ ) showed strong reliability. Emotional well-being ( $\alpha = 0.76$ ) and social functioning ( $\alpha = 0.76$ ) had good reliability, whereas energy/ fatigue ( $\alpha = 0.69$ ) was acceptable. Females reported lower scores in physical functioning ( $634.19 \pm 273.75$ ) compared to males ( $746.91 \pm 254.77$ ,  $p = 0.001$ ). Similarly, role functioning (physical) was lower in female ( $232.48 \pm 168.07$ ) than males ( $298.18 \pm 152.70$ ,  $p = 0.001$ ), as well as role functioning (emotional) ( $170.94 \pm 137.75$  and  $206.18 \pm 127.58$ ,  $p = 0.01$ ). Participants aged above 61 years old had a significant higher emotional well-being mean ( $341.27 \pm 88.54$ ) compared to 31-40 aged participants ( $290.36 \pm 80.81$ ) ( $p = 0.03$ ). Furthermore, participants with a bachelor degree had a significant higher physical functioning mean  $763.05 \pm 239.87$  compared to participants with a primary school degree. There are many factors that affect the quality of life for cardiovascular patients, including gender, age, education level, and others. Each of them has a major role in influencing the quality of life. It was found that women's physical and psychological condition is lower than men's due to physiological differences. Besides, older people accept the disease better, which positively affects the quality of life. In addition to the educational level, patients who have bachelor degree have better quality of life according to increasing awareness and acceptance of the disease.

**Keywords:** Cardiovascular; Diabetes; Heart diseases; Hypertension; Quality of life; SF-36

## INTRODUCTION

Cardiovascular diseases are the main cause of death throughout the worldwide, around 16.7 million deaths occurred each year, related to strokes and heart attacks<sup>1</sup>. A total of 7.2 million deaths are caused due to ischemic heart disease in 2004, moreover, cerebrovascular disease led to 5.5 million deaths. As a result, 22% of all global mortality caused by cardiovascular diseases<sup>2</sup>. According to that cardiovascular diseases are one of the most common causes of death. Prior studies showed that the quality of life is generally substandard for heart diseases patients. According to that it is important to put regular programs offer suitable and quality services to progress the quality of life of these patients<sup>3</sup>.

Compared to high-income countries, cardiovascular mortality rates have declined, while low- and middle-income countries have not<sup>4</sup>. Previous studies have found that the differences in patterns of cardiovascular mortality between different subgroups need further research to find the best treatment and prevention methods and to improve the quality of life of patients with heart disease and how that can affect them<sup>5</sup>. Based on estimates from several studies, the years of life lost because of cardiovascular diseases are equal to 26% of the total years lost, which leads to about 1.5 million years loss<sup>6,7</sup>.

In previous studies, it has been shown that even with the increasing developments in prevention, diagnosis, treatment, and rehabilitation of

heart diseases, until now there is an increasing trend in the mortality resulting from these heart diseases. Alongside mortality, disability and high disease liability, these diseases lead to severe complications in mental and social parts of patients' and their caregivers' lives<sup>8,9</sup>. For this purpose, supportive approach of these patients should include various fields of their lives<sup>3</sup>.

The definition of quality of life is the awareness of people of life, standards, goals, morals, and interests<sup>10</sup>. Based on this definition, improving the quality of life of these patients is one of the most important things that must be taken into consideration, and therefore, it is important to measure and implement effective steps to implement this process<sup>11</sup>. The SF-36 is one of the most frequently used measures of health-related quality of life and involves of 36 objects include eight elements<sup>12</sup>. Several studies have highlighted a growing curiosity in using quality of life methods to assess the benefits of treatment in cardiovascular diseases. Accordingly, quality of life should be measured and to find the correlations with age, sex, and nationality<sup>13</sup>. The aim of this study was to assess the quality of life for patients diagnosed with cardiovascular diseases in Saudi Arabia.

## METHODS

**Study design:** This is an online observational cross-sectional survey

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study that was conducted in Saudi Arabia between January and February 2025.

**Study population and sampling procedure:** Convenience sampling technique was utilized to recruit the study participants. Cardiovascular patients who are diagnosed by their physician and currently taking medications to manage their conditions formed the study population. The inclusion criteria were males or females, diagnosed with cardiovascular condition(s). There were no restrictions concerning participants age, duration of disease, or any socioeconomic characteristics. We excluded participants who refused to provide their consent or who do not meet the inclusion criteria.

The study participants were recruited using social media platforms such as WhatsApp, Instagram, and X. The invitation letter for the survey explicitly stated the objective of the study. The survey participants were advised that their fulfilment of the survey constitutes informed consent. The study participants were advised that their data would not be disclosed to any third party. Additionally, the results of the investigation will be disclosed in an anonymous manner.

**Questionnaire tool:** A previously validated tool was adopted in this research to examine participants quality of life<sup>14</sup>. The study instrument consists of 36 items designed to assess the quality of life of participants in 8 different domains. The Physical functioning domain include 10 items: 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12. The Role limitations due to physical health domain includes 4 items: 13, 14, 15, and 16. The Role limitations due to emotional problems domain includes 3 items: 17, 18, and 19. The Energy/fatigue domain includes 4 items: 23, 27, 29, and 31. The Emotional well-being domain includes 5 items: 24, 25, 26, 28, and 30. The Social functioning domain includes 2 items: 20 and 32. The Pain domain includes 2 items: 21 and 22. The General health domain includes 5 items: 1, 33, 34, 35, and 36. The score calculated by summing the responses to respective items. Besides, participants demographics were examined such as gender, age, education level, and city of residence.

**Ethical approval:** Ethical approval for this study was obtained from the Imam Mohammad Ibn Saud Islamic University's institutional review board (IRB) (Project number: 764/2025).

**Data analysis:** The analyses were performed using the Statistical Package of Social Sciences software, version 29.0. Descriptive statistics such as the frequency and percentage were utilized for categorical variables, and the mean, and the standard deviation (SD) were utilized for the continuous variables. The Analysis of Variance (ANOVA) test and the independent t-test were performed to examine the difference in continuous variables. To ensure the reliability of the instrument, internal consistency which measures how closely related the items are for each scale was calculated using Cronbach's alpha coefficient for perceptions score, with values of 0.70 and above indicating good internal consistency.

## RESULTS

The sample consists of 275 males (70.2%) and 117 females (29.8%). Participants were distributed across different age groups, with the highest representation in the 41-50 age group (119, 30.4%). Followed by 51-60 years (106, 27.0%) and 61 years and above (79, 20.2%). Regarding education, the majority held a bachelor's degree (203, 51.8%), followed by high school graduates (122, 31.1%) and master's degree holders (25, 6.4%). Further details about demographic characteristics are provided in Table 1.

**Table 1.** Demographic characteristics of the participants

		N	%
Gender	Female	117	29.8%
	Male	275	70.2%
Age	18-30	32	8.2%
	31-40	56	14.3%
	41-50	119	30.4%
	51-60	106	27.0%
	61-	79	20.2%
Education level	Primary	13	3.3%
	Middle	19	4.8%
	High	122	31.1%
	Bachelor	203	51.8%
	Master	25	6.4%
	PhD	10	2.6%
City of residence	Baha	3	0.8%
	Jouf	5	1.3%
	North	4	1.0%
	Riyadh	169	43.1%
	East	47	12.0%
	Qasim	26	6.6%
	Madina	26	6.6%
	Tabouk	4	1.0%
	Jazan	5	1.3%
	Hail	8	2.0%
	Aseer	18	4.6%
	Mecca	72	18.4%
	Najran	5	1.3%

The reliability analysis of the SF-36 questionnaire demonstrated strong internal consistency across most domains. In details, physical functioning had excellent reliability (Cronbach  $\alpha = 0.91$ ), while role functioning (physical  $\alpha = 0.89$ , emotional  $\alpha = 0.90$ ) and pain ( $\alpha = 0.83$ ) showed strong reliability. Emotional well-being ( $\alpha = 0.76$ ) and social functioning ( $\alpha = 0.76$ ) had good reliability, whereas energy/ fatigue ( $\alpha = 0.69$ ) was acceptable. However, general health ( $\alpha = 0.53$ ) exhibited low reliability, suggesting potential variability, Table 2.

**Table 2.** Reliability analysis of SF-36 domains: Cronbach's alpha, mean, and standard deviation

	Number of items	Cronbach alpha	Mean	SD
Physical functioning	10	0.91	713.27	265.30
Role functioning/ physical	4	0.89	278.57	160.08
Role functioning/ Emotional	3	0.90	195.66	131.51
Energy/Fatigue	4	0.69	211.22	68.68
Emotional well-being	5	0.76	316.89	89.55
Social Functioning	2	0.76	147.59	46.82
Pain	2	0.83	147.59	46.82
General health	5	0.53	303.13	81.71

Females reported lower scores in physical functioning ( $634.19 \pm 273.75$ ) compared to males ( $746.91 \pm 254.77$ ,  $p = 0.001$ ). Similarly, role functioning (physical) was lower in female ( $232.48 \pm 168.07$ ) than males ( $298.18 \pm 152.70$ ,  $p = 0.001$ ), as well as role functioning (emotional) ( $170.94 \pm 137.75$  and  $206.18 \pm 127.58$ ,  $p = 0.01$ ). Participants aged above 61 years old had a significant higher emotional well-being mean ( $341.27 \pm 88.54$ ) compared to 31-40 aged participants

**Table 3.** Comparison of Sf-36 domains across demographic factors

		Physical functioning	P value	Role functioning / physical	P value	Role functioning/ Emotional	P value	Energy/ Fatigue	P value	Emotional well-being	P value	Social Functioning	P value	Pain	P value	General health	P value
Gender	Female	634.19 ± 273.75	0.001	232.48 ± 168.07	0.001	170.94 ± 137.75	0.01	184.96 ± 71.05	0.001	298.63 ± 93.58	0.008	127.78 ± 50.73	0.001	127.78 ± 50.73	0.001	286.32 ± 80.58	0.08
	Male	746.91 ± 254.77		298.18 ± 152.70		206.18 ± 127.58		222.40 ± 64.60		324.65 ± 86.80		156.02 ± 42.42		156.02 ± 42.42		310.27 ± 81.28	
Age	18-30	739.06 ± 287.57	0.124	271.88 ± 165.07	0.97	209.38 ± 120.11	0.09	224.38 ± 64.40	0.16	320.00 ± 94.22	0.003	159.38 ± 41.27	0.35	159.38 ± 41.27	0.35	308.59 ± 86.98	0.73
	31-40	731.25 ± 259.47		275.00 ± 164.32		167.86 ± 142.84		201.43 ± 66.59		290.36 ± 80.81		141.16 ± 49.18		141.16 ± 49.18		303.57 ± 81.24	
	41-50	736.13 ± 246.32		278.99 ± 158.31		179.83 ± 136.90		205.88 ± 66.20		302.52 ± 87.00		149.66 ± 45.81		149.66 ± 45.81		294.54 ± 79.93	
	51-60	723.11 ± 260.88		286.79 ± 163.93		205.66 ± 127.86		208.11 ± 73.54		327.92 ± 91.16		148.96 ± 49.23		148.96 ± 49.23		307.08 ± 82.72	
	61+	642.41 ± 287.35		272.15 ± 156.02		220.25 ± 120.23		225.06 ± 67.59		341.27 ± 88.54		142.41 ± 45.22		142.41 ± 45.22		308.23 ± 82.21	
	Primary	253.85 ± 193.07		100.00 ± 122.47		123.08 ± 142.33		163.08 ± 40.70		293.85 ± 70.42		93.85 ± 31.63		93.85 ± 31.63		250.00 ± 61.24	
Education level	Middle	642.11 ± 250.15	0.001	231.58 ± 163.48	0.001	205.26 ± 117.73	0.13	201.05 ± 77.88	0.006	307.37 ± 83.32	0.01	141.32 ± 48.30	0.001	141.32 ± 48.30	0.001	275.00 ± 83.75	0.04
	High	693.85 ± 264.70		262.30 ± 164.81		177.87 ± 139.37		203.28 ± 65.93		302.62 ± 89.37		144.84 ± 46.23		144.84 ± 46.23		295.90 ± 75.95	
	Bachelor	763.05 ± 239.87		301.48 ± 149.74		206.90 ± 126.85		214.88 ± 67.50		320.79 ± 89.46		152.91 ± 45.09		152.91 ± 45.09		311.82 ± 82.59	
	Master	718.00 ± 231.34		292.00 ± 168.13		216.00 ± 117.90		246.40 ± 69.21		374.40 ± 82.37		150.80 ± 49.87		150.80 ± 49.87		311.00 ± 82.31	
	PhD	660.00 ± 356.53		300.00 ± 169.97		210.00 ± 144.91		228.00 ± 92.95		316.00 ± 97.89		147.00 ± 56.63		147.00 ± 56.63		317.50 ± 117.29	
	Baha	616.67 ± 351.19		266.67 ± 230.94		300.00 ± 0.00		220.00 ± 124.90		400.00 ± 72.11		141.67 ± 84.31		141.67 ± 84.31		316.67 ± 104.08	
City	Jouf	820.00 ± 182.35	0.41	320.00 ± 178.89	0.19	160.00 ± 151.66	0.24	212.00 ± 54.04	0.28	328.00 ± 111.00	0.04	131.00 ± 52.01	0.48	131.00 ± 52.01	0.48	305.00 ± 62.25	0.64
	North	825.00 ± 132.29		375.00 ± 50.00		200.00 ± 141.42		250.00 ± 103.92		355.00 ± 97.13		167.50 ± 40.93		167.50 ± 40.93		312.50 ± 112.73	
	Riyadh	738.46 ± 251.72		288.17 ± 154.62		205.33 ± 127.36		218.93 ± 70.55		326.51 ± 86.40		151.57 ± 47.37		151.57 ± 47.37		314.94 ± 85.97	
	East	696.81 ± 272.35		255.32 ± 161.26		174.47 ± 137.47		209.79 ± 70.88		317.87 ± 90.53		142.66 ± 42.27		142.66 ± 42.27		288.83 ± 72.20	
	Qasim	675.00 ± 277.94		257.69 ± 181.49		230.77 ± 115.82		210.00 ± 59.93		313.08 ± 93.11		156.92 ± 36.85		156.92 ± 36.85		287.50 ± 80.39	
	Madina	780.77 ± 216.83		303.85 ± 148.27		180.77 ± 144.28		204.62 ± 59.41		310.77 ± 95.54		144.81 ± 49.71		144.81 ± 49.71		300.96 ± 80.46	
	Tabouk	637.50 ± 332.60		175.00 ± 170.78		125.00 ± 150.00		160.00 ± 40.00		255.00 ± 82.26		107.50 ± 50.08		107.50 ± 50.08		275.00 ± 147.20	
	Jazan	840.00 ± 330.53		360.00 ± 89.44		300.00 ± 0.00		272.00 ± 68.70		400.00 ± 64.81		174.00 ± 47.75		174.00 ± 47.75		345.00 ± 51.23	
	Hail	562.50 ± 203.10		125.00 ± 183.23		175.00 ± 128.17		180.00 ± 50.14		240.00 ± 93.20		136.88 ± 48.55		136.88 ± 48.55		306.25 ± 82.10	
	Aseer	672.22 ± 300.60		250.00 ± 168.91		150.00 ± 142.46		194.44 ± 74.46		316.67 ± 80.07		145.83 ± 53.03		145.83 ± 53.03		293.06 ± 70.61	
	Mecca	668.06 ± 292.55		288.89 ± 159.71		193.06 ± 133.56		200.56 ± 65.52		299.72 ± 90.66		143.33 ± 46.90		143.33 ± 46.90		290.97 ± 78.76	
	Najran	700.00 ± 308.22		240.00 ± 181.66		120.00 ± 164.32		212.00 ± 62.61		280.00 ± 54.77		120.00 ± 49.12		120.00 ± 49.12		300.00 ± 66.14	

(290.36 ± 80.81) (p = 0.03). Furthermore, participants with a bachelor degree had a significant higher physical functioning mean 763.05 ± 239.87 compared to participants with a primary school degree. Additional details about SF-36 domains stratified by demographics are provided in Table 3.

## DISCUSSION

Cardiovascular diseases are associated with wide range of complications among patients from all age groups that impact their quality of life<sup>15,16</sup>. The aim of this study was to assess the quality of life for patients diagnosed with cardiovascular diseases in Saudi Arabia. As mentioned earlier, the most important tool that can use in assessment of the quality of life for patients who suffer from cardiovascular diseases is the SF36

questionnaire, which was a standard questionnaire extensively used in many studies conducted in the cardiovascular disease<sup>3</sup>. In this study females' patients reported lower scores in physical functioning (634.19 ± 273.75) compared to males (746.91 ± 254.77, p = 0.001). Similarly, role functioning (physical) score was lower in female (232.48 ± 168.07) than males (298.18 ± 152.70, p = 0.001), as well as role functioning (emotional) (170.94 ± 137.75 and 206.18 ± 127.58, p = 0.01).

In the prior studies Reynolds, Hawes, and Riedinger illustrated that there is a significant connection between gender and quality of life<sup>17,18</sup>. Some research considers this fact to be a result of variances in the biological and psychological characteristics of males and females. Moreover, one of the most important factors affecting quality of life is gender<sup>3</sup>. Also, in other study females had inferior scores than males on

some scales, mostly the emotional subscales<sup>19</sup>. As a justification to the prior results in our societies and culture, the existence of differences between women and men may be an actual reason of these differences, as finding that women are less physically active than men, and lack of physical activity, poor adherence, and performance can be an important factor in reducing quality of life<sup>20</sup>. Therefore, according to that the role of increasing the awareness to the benefits and the importance of physical activity and sports is so critical to decrease the percentage in death in women who have cardiovascular diseases as well as improving their quality of life.

Furthermore, according the emotional results, it is known that women are more emotional, and this is due to the physiological differences between men and women, as women have larger quantities of the estrogen hormone, which plays a major role in increasing emotions and feelings. In addition, pregnancy, and breastfeeding also have a role in increasing emotions in women. All these factors play a role in influencing women's emotions and making them more sensitive. Based on all the above, women are more affected by cardiovascular diseases and their impact on their quality of life than men<sup>21</sup>. Therefore, it is so important for increasing the awareness of this subject by campaigns talking more about these factors and encourage patients to enroll to the courses that can improve their mental well-being to improve their quality of life, which indirectly affects the economy and the development of societies<sup>22</sup>.

In previous studies, one of the most commonly identified factors that is associated with improving patients' quality of life was younger age<sup>23</sup>. However, in this study the participants aged above 61 years old had a significant higher emotional well-being mean ( $341.27 \pm 88.54$ ) compared to 31-40 aged participants ( $290.36 \pm 80.81$ ) ( $p = 0.03$ ). In comparison to other study patients younger than 65 years had poorer well-being quality of life scores on total scales and some subscales in comparison to older patients. As well as patients younger than 65 had inferior total health-related quality of life on 1 scale than did patients 65 and older<sup>19</sup>.

Based on these results, it can be interpreted that older people have reached the stage of emotional maturity and are more aware and have many life experiences that may have a major role in accepting the disease and living with it compared to younger people who believe that this age is the age of work and achievement, and thus leads to a major impact on their mental well-being, performance, and quality of life. According to that emphasizing the importance of increasing awareness in accepting these diseases, can help in improving the quality of life. Also, discussion sessions and psychological support play a major role in accepting these diseases and improving the quality of life.

In this study participants with a bachelor degree had a significant higher physical functioning mean  $763.05 \pm 239.87$  compared to participants with a primary school degree. This is aligning with the findings of previous research, which showed that the most vital aspects affecting quality of life were gender, age, education level, relationship status, job-related status, suffering length, and number of hospitalizations<sup>3</sup>. All these findings indicate the importance of identifying the factors associated with cardiovascular diseases and taking them into consideration as they may increase or decrease the severity of the disease and its impact on the quality of life. Therefore, increasing education in society, and increasing awareness campaigns about heart diseases, their prevention and treatment, and how to accept and live with the disease have a fundamental and effective role in increasing the quality of life.

This study has limitations. The challenges faced in this research is the study design itself, which is a cross-sectional survey study that might have restricted the ability to examine causality. Besides, patients' diagnosis and other data are self-reported, which might not precisely affect their conditions and health status. Moreover, the use of convenience sampling may limit the diversity of the sample and introduce potential bias. Therefore, the study findings should be interpreted carefully.

## CONCLUSION

**There are many factors that affect the quality of life for cardiovascular patients, including gender, age, education level, and others. Each of them has a major role in influencing the quality of life. It was found that women's physical and psychological condition is lower than men's due to physiological differences. Besides, older people accept the disease better, which positively affects the quality of life. In addition to the educational level, patients who have bachelor degree have better quality of life according to increasing awareness and acceptance of the disease.**

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**Competing Interest:** None

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