



Quality of Life and Associated Factors Among Patients with Coronary Artery Disease Who Underwent Coronary Revascularization Interventions at Jakaya Kikwete Cardiac Institute.

Edith Shose mlay^{1*}, Reuben mutagaywa^{1,2}, Peter kisenge², Zahra D Khan and Abdul Rafey Usmani

¹Department of internal medicine muhimbili university of health an allied science, dar es salaam, tanzania.²jakaya kikwete cardiac institute, dar es salaam, tanzania,

²Department of cardiology agakhan health centre, dar es salaam, tanzania.

³Agakhan health centre, dar es salaam, tanzania.

Corresponding Author: Edith Shose Mlay, department of internal medicine, muhimbili university of health and allied health sciences, p.o box 65001, dar es salaam, Tanzania.

Submitted: 15 Feb 2024

Accepted: 19 Feb 2024

Published: 26 Feb 2024

Citation: E S mlay¹, R mutagaywa^{1,2}, P kisenge², Z D Khan, A R usmani. (2024). Quality of Life and Associated Factors Among Patients with Coronary Artery Disease Who Underwent Coronary Revascularization Interventions at Jakaya Kikwete Cardiac Institute. Journal of Diabetes Research, Reviews and Reports. Research Article. 2(1).01-05.

Abstract

Background: Both percutaneous coronary interventions (pci) and coronary artery bypass graft (cabg) has shown to improve health related quality of life (hrqol) in terms of physical, emotional, and social functions. To our knowledge, the nature of hrqol among this group of patients remains unknown in tanzania.

Methods: We conducted a descriptive cross-sectional study amongst patients who underwent pci and cabg from january 2018 to december 2019 at jkci. Clinical data were obtained from patients and hospital medical records. The hrqol was assessed by using the macnew heart disease hrqol questionnaire for physical, emotional and social domains. Data were analyzed using spss version 23. Continuous data was presented as means \pm sd, inferential statistics and frequency for categorical data. Anova and t-test were used to compare different means of continuous variables. Multiple linear regression model was used to determine factors associated with hrqol.

Results: Among 181 patients who underwent cabg and pci, 162(89.5%) were included in this study. The mean (sd) age was 66 \pm 9 years. Male patients were 114(70.4%), 105(64.8%) had history of cigarette smoking, 138(85%) had diabetes mellitus, and 65(41%) had single vessel involvement, 47(29%) double vessels, 48(30%) had triple vessels disease. The internal consistency for the hrqol macnew questionnaire (cronbach's alpha coefficient) was 0.94. An overall hrqol mean (sd) score was 5.51(0.92). Cabg had better mean (sd) score as compared to pci \pm 5.83(0.94) vs (5.42(0.89) \pm). Multiple linear regression analysis revealed that residents of dar es salaam (p=0.047), secondary and college education (p=0.003 and p=0.024 respectively), alcohol (p=0.002), history of cigarette (p=0.002), and number of vessels involved (p= 0.003) were determinants of quality of life.

Conclusion: this study showed an overall moderate hrqol scores among patients who undergone pci and cabg at jkci. Predictors for the better hrqol were being residing in dar es salaam, higher level of education, no history of alcohol intake, no history of cigarette smoking, and single vessel disease.

Introduction

Cardiovascular diseases (cvd) are number one cause of death globally. Who estimated 17.9 million deaths (31%) of all death yearly in 2016 are due to cardiovascular disease (cvd) there were an estimated 7.29 million cases of acute myocardial infarctions and 110.55 million prevalent cases of cad in 2015. Cad accounted for almost one-half of all cvd cases in central asia and eastern europe, but a smaller proportion in central europe, where other cardiovascular and circulatory diseases made up a larger proportion of total cases [1,2].

CAD was previously considered rare in sub-saharan africa(ssa) but now ranks 8th among the leading causes of death in the region since the incidence of myocardial infarction is rising in (ssa) [3]. Efforts were done to reduce mortality, interventions for timely reperfusion by percutaneous coronary intervention (pci) and coronary artery bypass graft (cabg) is more valuable [4]. A study done by alice kajage et al in tanzania revealed that among all cardiac patients attended at jkci 45% were affected by cad. Reperfusion therapy conducted to 42% of all cad patients in africa, to our knowledge, studies in our settings on health-related quality of life (hrqol) and associated factors were not extensively

investigated (4). To our knowledge, the nature of hrqol among this group of patients remains unknown in tanzania.

Both cabg and pci had been shown to improve hrqol in terms of physical, emotional, and social functions for patient with stable angina with a single vessel or multi vessels coronary artery disease [5]. Cabg shown improvement after 6 months, but by 48 months improvement were seen for all pci and cabg treatment procedures [6]. This study showed an overall moderate hrqol scores among patients who undergone pci and cabg at jkci. Predictors for the better hrqol were being residing in dar es salaam, higher level of education, no history of alcohol intake, no history of cigarette smoking, and single vessel disease. The evidence from this study will widen the spectrum of management to the patients with cad. Health care providers should health education on the risk modifiable factors to cad patients. The study has shown that hrqol assessment is of paramount important in determine outcome following cabg and pci. Macnew tool which was used in this study can be incorporated in daily management of patients with cad before and sequentially after procedure.

Methodology

We conducted a descriptive cross-sectional study amongst patients who underwent pci and cabg from january 2018 to december 2019 at jkci. All patients who consented were included in the study. The hrqol was assessed by using the macnew hrqol questionnaire. The tool has 27 questions, each question has maximum of 7 scores with a total of 189 scores measured as continuous data. The tool assesses each individual in terms of 3 domains. Physical functioning 13 elements, social functioning 13 elements, emotional functioning 14 elements and 5 elements for angina symptoms. One question out of 27 can have more than 2 elements. We used the following mean scoring algorithm: low (≤ 4.9), moderate (5 - 6), high (>6) for the global scale and for physical, emotional and social subscale scores. Hrql before and after procedure was not assessed, we assessed patients six months to twenty months after the procedure. Clinical data include bmi, rbg, type of procedure, number of vessels involved, comorbidities example; hypertension, diabetes, stroke, heart failure and others were obtained from the patients and the hospital medical records.

Data were analyzed using spss version 23. Summary statistics was reported as means with standard deviation for continuous data, inferential statistics and frequency for categorical data. Anova and t-test were used to compare different means of continuous variables. Multiple linear regression model was used to determine factors related to the quality of life in patients underwent coronary interventions.

Results

From january 2018 to december 2019 a total of 181 patients underwent interventions following cad out of which 162(89.5%) met inclusion criteria, among them 124(77.78%) undergone pci and 38(22.22%) underwent cabg. The mean (sd) age was 66 ± 9 , male (70.4%), married (92.6%), resident in dar-es salaam (54.9%), history of cigarette smoking (64.8%), health insurance coverage (98.1%) and college or university level of education

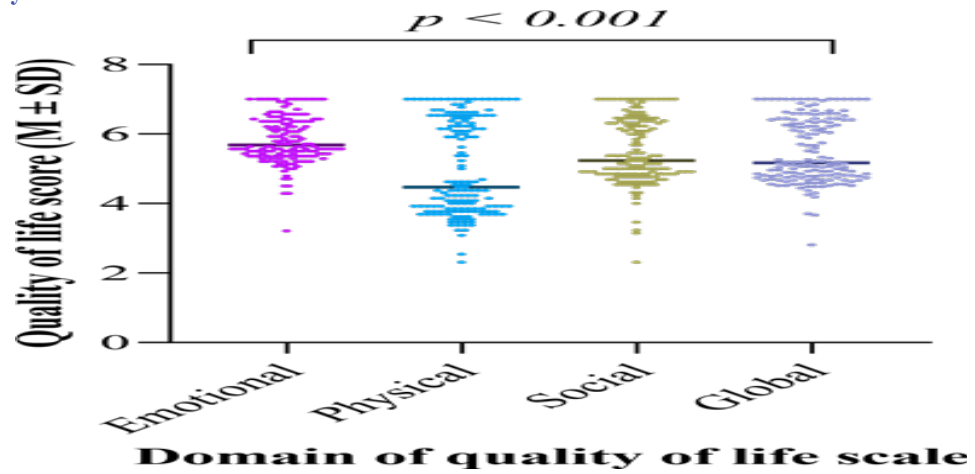
(34.0%) (table 1).

Table 1: Socio-Demographic Characteristics of the Study Participants

Variables	Category	Frequency (n)
Mean age \pm standard deviation (sd) (years) 66 ± 9		
Age group (years)	≤ 60	52(32.1)
	>60	110(67.9)
Sex	Male	114(70.4)
	Female	48(29.6)
Residence	Dar es salaam	89(54.9)
	Outside dar es salaam	73(45.1)
Education level	No formal education	3(1.9)
	Primary	55(34.0)
	Secondary	49(30.2)
	College or university	55(34.0)
Occupation	Not employed	42(25.9)
	Self employed	54(33.3)
	Public employment Private sector employment	55(34.0) 11(6.8)
Marital status	Single	12(7.4)
	Married	150(92.6)
Payment for medical treatment	Private	3(1.9)
	Insurance	159(98.1)
Heavy alcohol intake	Yes	60(37.0)
	No	102(63.0)
History-cigarette smoking	Yes	105(64.8)
	No	57(35.2)
Diabetic mellitus	Yes	138(85.2)
	No	24(14.8)
Hypertension	Yes	149(92.0)
	No	13(8.0)
Number of vessels	One	65(40.6)
	Two	47(29.4)
	Three	48(30.0)

Overall mean (sd) hroql (global) score was 5.51(0.92); emotional, social and physical domains both had moderate range mean (sd) hrqol score of 5.84(0.68), 5.5(0.93), and 5.01(1.34) respectively. Emotional domain had higher values as compared to social and physical domains with few outliers. **Figure 3**

Figure 1: Domains of Quality-of-Life Scale



Multiple linear regression model examined association between hrqol and various independent factors among patients who underwent pci and cabg. Residence- dar es salaam p=0.047, 95% ci, secondary education level p=0.003, 95% ci, alcohol and cigarette p=0.002, 95%ci, number of vessels involved p= 0.003, 95% ci, were determinants of healthrelated quality of life (table 7)

Sex (male)	0.131	0.136	0.065	0.96	-0.14	0.40	0.334
	Unstandardized coefficients		Standardized		95.0% ci		
Variables	B	standard error	Coefficient β	T	Lower	upper	p-value
Age ≤ 60	0.207	0.133	0.105	1.556	-0.06	0.47	0.122
Residence (dar)	0.248	0.124	0.134	2.000	0.003	0.494	0.047
Secondary education	0.476	0.155	0.239	3.068	0.17	0.78	0.003
College education	0.353	0.154	0.182	2.287	0.05	0.66	0.024
Self employed	0.050	0.140	0.026	0.357	-0.23	0.33	0.721
Private employment	-0.213	0.260	-0.056	-0.818	-0.73	0.30	0.415
Married	0.192	0.241	0.053	0.798	-0.28	0.67	0.426
Alcohol intake	-0.435	0.141	-0.227	-3.09	-0.71	-0.16	0.002
Cigarette smoking	-0.444	0.139	-0.232	-3.188	-0.72	-0.17	0.002
Bmi (≤ 25kg/m ²)	-0.202	0.157	-0.089	-1.288	-0.51	0.11	0.200
Number of vessels	-0.225	0.075	-0.204	-3.004	-0.37	-0.08	0.003
Dm	-0.341	0.180	-0.133	-1.891	-0.70	0.02	0.061

Low mean (sd) score = □4.9, Moderate Mean (sd)= 5-6, High Mean (sd)= >6

Table 2: Estimated Regression Coefficients from the Multiple Linear Regression Models to Predict Quality of Life from Related Factors

Discussion

In this study, a total of 162 patients who underwent pci and cabg between January 2018 and December 2019, were assessed for health-related quality of life and associated factors. Among which 124(77.8%) underwent pci while 38(22.2) underwent cabg. The overall/global quality of life was moderate for the entire study population, so was emotional, social and physical functioning. This is consistent with findings from a meta-analysis done by Takousi et al on hrqol after coronary revascularization in 2016, in a total of 34 studies they concluded that pci and cabg had moderate effects on improving hrqol [7]. Another study done by McGrath BM et al in diabetic patient who underwent revascularization surgery, they observed quality of life improvement in emotional, social and physical functioning [5].

Regarding the age of our participants the global hrqol was found to be moderate in both ≤ 60 years and >60 years, and in all three domains, however better qol was seen in patients with ≤ 60 years as compared to those with >60 years. This finding is consistent with the study done by Pfisterer et al that revealed older patients more than 75 years had low improvement in hrqol score as compared to younger patients [8]. The qol in non-smokers and past smokers was compared in the current study and revealed moderate hrqo for both groups although the mean was higher for non-smokers. Study done by Darvishpour and Welke et al both revealed similar effects with poor hrqol outcome for cigarette smokers as compared to those who never smoke [9,10]. This can be explained by the fact that the effect of tobacco persists up to 5 years after cessation of smoking, in return it increases the risk of atherosclerosis which has effects even after the surgical interventions and reconstruction of the vessels hence poor healing process [10,11].

In this study non-diabetic patients were found to score higher compared to diabetic patients in all three domains. This finding is compatible with a veterans randomised controlled trial which revealed diabetes is a predictor of poor outcome in hrqol [12]. Our study revealed that patients with single-vascular coronary artery disease (cad) had higher hrqol score in all three domains as compared to double and triple vessels involvement. This finding was similar to study by Darvishpour et al, which found that patient with single vessels had higher hrqol than others, another study by Miranda et al, revealed multiple vessel involvement increases procedure complexity especially when the vessels are totally occluded and calcified and these will have implication in healing process and in return affects health related quality of life to these patients [10,13].

Our study findings revealed that elementary to primary education level patients, had low hrqol scores as compared to those who had secondary to college/university level of education in all three domains. Several studies have similar results; study done by Yazdani et al on comparison of hrqol after percutaneous coro-

nary intervention and coronary artery bypass surgery found that people with no education/low level of education had poor quality of life after the interventions. Taghadosi et al reported similar findings (14,15). Education level changes people's attitude to health which can improve health-related quality of life.

The evidence from this study will widen the spectrum of management to the patients with cad. The study has shown that health related quality of life assessment is of paramount importance in determining outcome following cabg and pci. Macnew tool which was used in this study can be incorporated in daily management of patients with cad before and sequentially after procedure. There was no documentation of hrqol of patients with cad before and after procedure (baseline hrqol score). Assessment of hrqol before cabg and pci would have assisted us in comparing quality of life before and after procedure.

This study showed an overall moderate hrqol scores among patients who underwent pci and cabg at JKCI. The independent predictors for the better hrqol were being residing in Dar es Salaam, higher level of education, no history of alcohol intake, no history of cigarette smoking, and single vessel disease. Given the reliability of the Macnew hrqol questionnaire shown from this study, we recommend it for routine use in our clinical settings.

Conclusion

This study showed an overall moderate hrqol scores among patients who underwent pci and cabg at JKCI. Predictors for the better hrqol were being residing in Dar es Salaam, higher level of education, no history of alcohol intake, no history of cigarette smoking, and single vessel disease.

References

1. Jamee Shahwan A, Abed Y, Desormais I, Magne J, Preux P M, et al (2019) Epidemiology of coronary artery disease and stroke and associated risk factors in Gaza community–Palestine. *PloS one* 14: e0211131.
2. Roth G A, Johnson C, Abajobir A, Abd-Allah F, Abera S F, et al. (2017) Global, regional, and national burden of cardiovascular diseases for 10 causes, 1990 to 2015. *Journal of the American college of cardiology* 70: 1-25.
3. Thomas H, Diamond J, Vieco A, Chaudhuri S, Shinnar E, et al. (2018) Global atlas of cardiovascular disease 2000-2016: the path to prevention and control. *Global heart*, 13: 143-163.
4. Stassen W, Wallis L, Lambert C, Castren M, Kurland L (2017) Percutaneous coronary intervention still not accessible for many South Africans. *African journal of emergency medicine* 7: 105-107.
5. McGrath B M, Norris C M, Hardwicke-Brown E, Welsh R C, Bainey K R (2017) Quality of life following coronary artery bypass graft surgery vs. percutaneous coronary intervention in diabetics with multivessel disease: a five-year registry study. *European Heart Journal-Quality of Care and Clinical Outcomes* 3: 216-223.
6. Brorsson B, Bernstein S J, Brook R H, Werkö L (2001) Quality of life of chronic stable angina patients 4 years af-

-
- ter coronary angioplasty or coronary artery bypass surgery. *Journal of Internal Medicine* 249: 47-57.
7. Takousi M G, Schmeer S, Manaras I, Olympios C D, Makos G, et al. (2016) Health-Related Quality of Life after Coronary Revascularization: A systematic review with meta-analysis. *Hellenic Journal of Cardiology* 57: 223-237.
 8. Pfisterer m, buser p, osswald s (2015) Outcome of elderly patient with chronic symptomatic coronary artery disease with an invasive vs optimized medical treatment strategies. *Jama netw open* 289: 1117–1123.
 9. Welke K F, Stevens J P, Schults W C, Nelson E C, Beggs V L, et al. (2003) Patient characteristics can predict improvement in functional health after elective coronary artery bypass grafting. *The Annals of thoracic surgery* 75: 1849-1855.
 10. Darvishpour a, javadi-pashaki n, salari a, sadeghi t, taleshan-nejad m (2017) Factors associated with quality of life in patients undergoing coronary angioplasty. *Int j health sci (qassim) [internet]* 11: 35-41.
 11. Salahuddin S, Prabhakaran D, Roy A (2012) Pathophysiological mechanisms of tobacco-related CVD. *Global heart* 7: 113-120.
 12. Rumsfeld J S, Magid D J, Plomondon M E, Sacks J, Henderson W, et al. (2003) Veterans Affairs Angina with Extremely Serious Operative Mortality (AWESOME) Investigators. Health-related quality of life after percutaneous coronary intervention versus coronary bypass surgery in high-risk patients with medically refractory ischemia. *Journal of the American College of Cardiology* 41: 1732-1738.
 13. Coelho P N, Miranda L M, Barros P M, Fragata J I (2019) Quality of life after elective cardiac surgery in elderly patients. *Interactive Cardiovascular and Thoracic Surgery* 28: 199-205.
 14. Taghadosi m, arani za, gilasi hr (2014) Quality of life in patients with ischemic heart disease 1: 19-26.
 15. Yazdani-Bakhsh R, Javanbakht M, Sadeghi M, Mashayekhi A, Ghaderi H, et al. (2016) Comparison of health-related quality of life after percutaneous coronary intervention and coronary artery bypass surgery. *ARYA atherosclerosis* 12: 124.

Copyright: ©2024 Edith Shose Mlay. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.