

PRIOR PERCUTANEOUS CORONARY INTERVENTION IS ASSOCIATED WITH LOW HEALTH-RELATED
QUALITY OF LIFE AFTER CORONARY ARTERY BYPASS GRAFT.

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Abstract

Background: Health-related quality of life (HRQoL) has become a major factor of the clinical health care since it plays a main role when making decision by patients and health care providers. The prediction of the success of surgical intervention such as coronary artery bypass graft (CABG) has been showed to be based on the HRQoL.

Aims: To investigate the associations between HRQoL and sociodemographic and clinical characteristics and examine the impact of a previous heart surgery (PHS) on HRQoL in Palestinian patients underwent CABG.

Methods: A cross-sectional study was conducted in a convenience sample of 119 Palestinian patients underwent CABG (76.5% males). The Short Form-36 healthy survey was used to evaluate the HRQoL. Sociodemographic factors and clinical characteristics including the presence of hypertension, diabetes mellitus, dyslipidemia and hypercholesterolemia were assessed.

Results: Analysis of variance (ANOVA) showed that a medida que aumenta la edad disminuye la HRQoL ($p<0.001$). In contrast, a mayor nivel educativo, seguridad en el trabajo y salario aumenta la HRQoL ($p<0.001$). Los pacientes sometidos a PHS refieren una peor HRQoL que aquellos que se han intervenido por primera vez a un CABGs ($p<0.001$) and all the domains of HRQoL were significantly lower in patients with PHS compared to patients without PHS ($p<0.05$). Logistic regression analysis revealed significant associations between all domains of HRQoL except for role physical and role emotional and PHS.

Conclusion: A previous heart surgery in patients underwent CABG was associated with low HRQoL. An increase of age was also related to low HRQoL whereas a high level of education and occupational status increase HRQoL. Nursing staffing should consider the impact of factors associated to HRQoL in patients underwent CABG to deliver a high-quality patient care.

40 **Key words:** Quality of life; coronary artery bypass graft; heart surgery; nursing care.

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Introduction

Cardiovascular diseases (CVD) are chronic diseases spread out worldwide and are the most common cause of death. CVD has been predicted to continue to occupy the first leading cause of death worldwide until 2020.¹ In fact, the prevalence of death due to CVD is 31.2% from all-cause mortality.² One of the most common prevalent CVD diseases is the coronary artery disease (CAD).

Currently, there are many methods in treating CAD including therapeutic medication, percutaneous transluminal coronary angioplasty, and coronary artery bypass graft (CABG) surgery.³ Decision of choosing the CABG to treat the CAD is based on the symptoms of patient, the extent of coronary artery pathology and the number of obstructed vessels.⁴ Available literature confirms the reduction in type and severity of post-operative symptoms. [MCorrea1] Thus, a prospective study from Taiwan shows an improvement in most symptoms including angina, dyspnea, fatigue, sleep problems and other psychological symptoms.⁵ However, the prediction of the success of surgical intervention has been showed to be based on the ability of patient to perform daily activities.⁶

Sixty patients admitted for coronary artery bypass graft for randomized controlled trial at a large university hospital in Denmark found that patients underwent CABG had a greater level of compliance with post-operative interventions such as physical exercise and psycho education.⁷ Pre-operative education is considered an essential and effective way to increase the patients' knowledge to establish the individualized goals in order to improve their health-related quality of life (HRQoL).⁸ Thus, HRQoL has become a major factor of the clinical health care since it plays a main role when making decision by patients and health care providers [MCorrea2]. The prediction of the success of surgical intervention such as CABG has been showed to be based on the HRQoL [MCorrea3]. Therefore, to investigate factors associated with HRQoL in order to optimize su

calidad de vida y en consecuencia sus salud among patients underwent CABG is of special interest. To our knowledge, there is no previous research conducted in Palestinian population in order to examine the potential factors influencing HRQoL in patients underwent CABG. In the context, the purpose of the study was to investigate the associations between HRQoL and sociodemographic and clinical characteristics and examine the impact of a previous heart surgery (PHS) on HRQoL in Palestinian patients underwent CABG.

Method and materials

Study design and participants

A cross-sectional study was conducted in Palestinian Medical Complexes including An-Najah National University Hospital, Nablus Specialist Hospital, and Arab Specialist Hospital in Nablus. Figure 1 details the sample collection. A convenience sample of 119 patients (61.98% males) who underwent CABG surgery was recruited. Todos los pacientes habían recibido la misma información acerca del procedimiento quirúrgico. Asimismo, los profesionales de enfermería realizaron un plan de cuidados estandarizado sobre cuidados pos-operatorios y de estilo de vida including exercise and nutrition. The contact information of selected study candidates collected from patient records. Exclusion criteria included patients with cognitive impairment, communication deficit and patients who have major co morbidities (cancer and kidney disease who undergo kidney dialysis), mobility limitation, cerebral vascular disease and quadriplegia. Additionally, patients who underwent recurrent CABG were excluded.

Ethical considerations

All participants received verbal and written information on the nature and purpose of the study and gave their written consent for their participation. Ethical approval for the work was

obtained from the three hospital Ethic Committees and conducted in accordance with the Declaration of Helsinki.⁹

Sociodemographic and clinical characteristics

Sociodemographic characteristics including gender, age, marital status, educational level, job and income were obtained from each participant at the baseline assessment. Clinical characteristics including hypertension, diabetes mellitus, dyslipidemia and hypercholesterolemia were obtained from the participants and from their medical records. Additionally, lifestyle factors including smoking and coffee consumption were collected y se registró la presencia de previous heart surgery (PHS) such as angioplasty or stent placement.

HRQoL

The Short Form Healthy Survey (SF-36 ®) was used to evaluate the HRQoL [MCorrea4]. This questionnaire consists of eight multi-item subscales including physical functioning, social functioning, role limitations due to physical problems, and role limitations due to emotional problems, mental health, energy/vitality, pain, and general health perception. Each of the SF-36 domains is scored on a scale of 0–100. Higher scores report a better HRQoL. The SF-36 was administrated 12 months after surgery. El cuestionario SF-36 presentó una elevada fiabilidad en nuestro estudio, de modo que el α -Cronbach fue de 0.962 en la muestra total. Asimismo, en los subgrupos de pacientes sometidos a PHS o sin intervención cardiaca previa fue de 0.967 y 0.950, respectivamente.

Statistical analysis

We described numeric variables through the mean $\pm$ standard deviation while qualitative or nominal variables were described through percentages and frequencies. The independent two-

sample t-test, or Mann-Whitney U-test, was used to compare the variables between the groups. Pearson's correlation coefficient (r) was used to test the correlation between previous heart surgery and all domains of HRQoL. Logistic regression analyses were conducted to determine the association between previous heart surgery and all domains of HRQoL in the overall population after adjusting for age and sociodemographic characteristics (education level, job and income). SPSS Statistics version 21.0 (SPSS. Chicago. IL. USA) was used for all the analyses. P values < 0.05 were considered to be statistically significant.

Results

The personal and clinical characteristics of the sample are presented in Table 1. A total of 119 patients from three hospitals of Palestinian participated in this study. Most participants were males (76.5%) and have an age range between 45-64 years (60.5%). Only the 29.4% had a high education level and 43.7% of participants had an income between 1500-3000 New Israeli Shekel (NIS). The presence of comorbidities were the following: hypertension (73.1%), diabetes mellitus (55.5%), dyslipidemia (84.0%), hypercholesterolemia (88.2%). Furthermore, the prevalence of smoking status and coffee consumption were 48.7% and 76.5%, respectively. Also it should be noted that the prevalence of PHS was 23.5%.

Los factores sociodemográficos como la edad, el nivel educativo, el trabajo desempeñado y los ingresos presentan diferencias estadísticas significativas con respecto a la HRQoL (Tabla 1). Se observa una clara tendencia a que a medida que aumenta la edad disminuye la HRQoL. Por otro lado, a mayor nivel educativo, seguridad en el trabajo desempeñado y salario aumenta la HRQoL. Con respecto a las comorbilidades, la HRQoL disminuye en el caso de que existan. Si bien solo la dislipidemia presenta diferencias estadísticas significativas. Destacar que los

fumadores y bebedores de café refieren una mayor HRQoL, llama especialmente la atención el hecho de que consuma café casi dos terceras partes de los pacientes. Asimismo señalar que aquellos pacientes sometidos a PHS refieren una peor HRQoL que aquellos que se han intervenido por primera vez con un CABGs, apareciendo diferencias estadísticas significativas.

Table 2 shows the domains of HRQoL of the study cohort and muestra los resultados de los dominios en función si los patients underwent CABG habían sido sometido o no PHS. Note that all the domains were significantly lower in patients with PHS compared to patients without PHS ($p<0.05$). Correlation analysis between PHS and domains of HRQoL are shown in Table 3. Pearson correlations revealed that all domains of HRQoL were correlated with the presence of PHS ($p<0.05$). The association analysis of previous heart surgery and all domains of HRQoL in the overall population, after adjusting for age and sociodemographic characteristics are shown in Table 4. Logistic regression analysis revealed significant associations between all domains of HRQoL except for role physical and role emotional and PHS.

Discussion

The aim of this study was to investigate the associations between HRQoL and sociodemographic and clinical characteristics and examine the impact of a PHS on HRQoL in Palestinian patients underwent CABG. Our findings support that a medida que aumenta la edad disminuye la HRQoL mientras que un mayor nivel educativo, una mayor seguridad en el trabajo y un mayor salario aumenta la HRQoL in these patients. Additionally, los pacientes sometidos a PHS refieren una peor HRQoL, showing that all the domains of HRQoL were significantly lower in patients with PHS compared to patients without PHS.

Our results are consistent with Peric et al.¹³ who reported that patients 60-69 years improved better than the younger patients in all domains, but found that the patients under 50 years old had improved in physical mobility, emotional reactions, pain and sleep. Similarly, Lavdaniti et al.¹⁴ reported that mental health is influenced by age, educational status, and occupational status. Also, Najafi et al.¹⁵ found that elderly patients had a higher score in the psychological dimension of HRQoL. In contrast, Chen, et al.¹⁶ found that HRQoL in patients who underwent CABG with ageing was not connected. The inconsistent findings reported among the studies might be explained by the fact that participants were divided into different time groups. Moreover, the present study revealed that there was no relationship between gender and HRQoL after CABG surgery. However, previous studies have reported contradictory results. [MCorrea5] Thus, Hweidi et al.¹⁷ reported that female patients had depression higher than male and Lavdaniti et al.¹⁴ reported that social role affected by gender and occupational status of the patients. ~~Also, Bjørnnes et al.¹⁸ found that female presented high worst pain than male. Moreover, Bak & Marcisz¹⁹ reported the energy, sleep, and physical mobility domains improved more favorable in men than in women and the severity of depression after surgery was better in men than in women.~~

On the other hand, we reported association between education level, job and income and HRQoL but we did not find any association with marital status. Hweidi et al.¹⁷ reported that patients without work had high prevalence of depression, patients who were married had low depression levels than unmarried, and also found an inverse relationship between depression score and patients' monthly income. Also, El-Baz et al.²⁰ found that patients with higher education level had better physical health outcome and Gierszewska et al.²¹ supported that degree of education, marital status or employment had an influence on improvement the HRQoL.

En cuanto a la presencia de comorbilidades, we only found that dyslipidemia was associated with HRQoL in patients underwent CABG. Previous studies have reported inconsistent findings[MCorrea6]. Thus, Kuo et al.²² found the patients with chronic kidney disease post- surgery CABG had worst physical function and HRQoL than their non- chronic kidney disease (CKD) and Shad et al.²³ showed physical and mental component of HRQoL was better in patients without any morbidity (diabetes mellitus or hypertension).

In line with Figueredo et al.¹² our study founded a high frequency of dyslipemia and hypertension among patients undergoing cardiac surgery. However, in contrast to our findings, other authors as Taghipour et al.¹⁰ and Middel et al.¹¹ reported a lower prevalence of these comorbidities. Regarding the frequency of diabetes mellitus, our research found a high prevalence of diabetes mellitus in patients underwent CABG than in previous studies conducted in Europe and American populations^{11,12}. Nevertheless, los resultados son similares a los reportados por Taghipour et al,¹⁰ en un estudio llevado a cabo en Irán. Therefore, the differences in the prevalence of comorbidities might be due to los estándares de salud en los distintos países.

HRQoL in patients underwent CBAG has been previous examined in different populations¹⁰⁻¹². Studies form other countries using the SF-36 have reported slightly different findings to our study (Table 5). En todos estos estudios se administró el SF-36 pasados en un periodo entre seis meses y un año tras la intervención quirúrgica de CABG .These differences can be due por las diferentes políticas sanitarias y la promoción de la salud en las distintas regiones geográficas. Además, las diferencias en las características sociodemográficas y clínicas podrían explicar las diferencias encontradas en la HRQoL.

Limitations and strengths

This study has some limitations that should be addressed. The cross-sectional design may have prevented us from measuring any change in HRQoL occurring over time and does not allow establishing causal relationships. In addition, since our study population comprised a well-characterized cohort of Palestinian adults, the results presented in this scenario may not be generalizable to other ethnicities or age ranges. In contrast, we would like to note that, to the best of our knowledge, this is the first study to examine the level of HRQoL in a cohort of Palestinian adults underwent CABG. Also we have used the SF-36, a reliable and valid assessment for measuring HRQoL in patients underwent CABG¹³⁻¹⁵.

Conclusion

In conclusion, a previous heart surgery in patients underwent CABG was associated with low HRQoL. An increase of age was also related to low HRQoL whereas a high level of education and occupational status increase HRQoL. Nursing staffing should consider the impact of factors associated to HRQoL in patients underwent CABG to deliver a high-quality patient care.

Implications for practice

- Nursing staffing have to consider the impact of factors associated to HRQoL in patients underwent CABG to deliver a high-quality patient care.
- Nurses must consider previous heart surgery as an important factor influencing HRQoL of patients underwent CABG.
- Nurses should take into account the importance of sociodemographic factors including age, job and income to prepare plan cares for patients underwent CABG.

220 **Declaration of conflicting interests**

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225 **Ethics**

226 The investigation conforms with the principles outlined in the Declaration of Helsinki.

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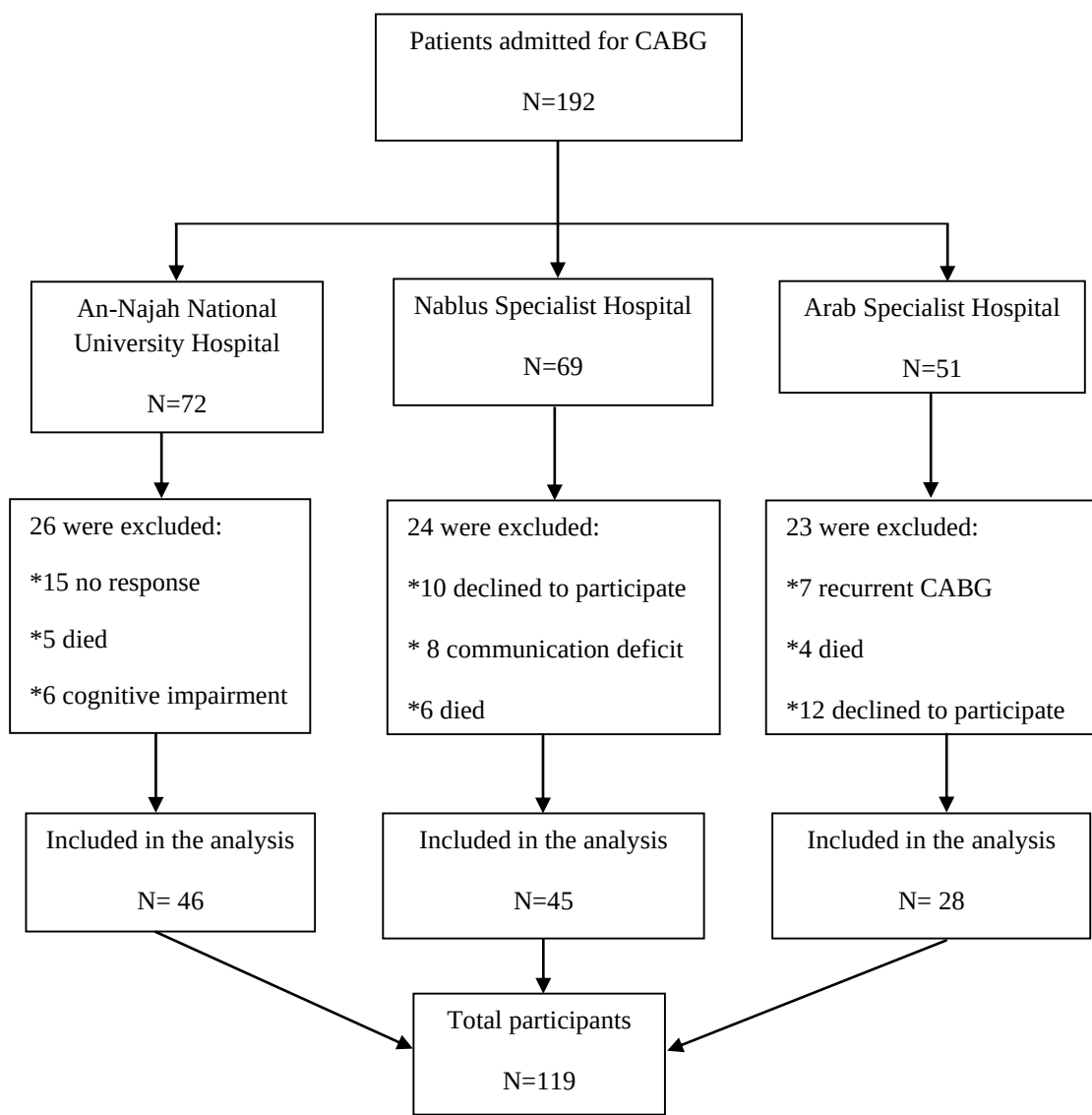


Figure 1. Sample collection.

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295 **Table 1. Sociodemographic and clinical characteristics and global score of HRQoL (n=119).**

Items		n	%	SF-36 score	p value
Sociodemographic					
Gender	Male	91	76.5	67.2±27.01	0.103
	Female	28	23.5	57.1±32.12	
Age	35-44 year	9	7.6	83.9±15.76	<0.001
	45-54 year	32	26.9	74.4±20.97	
	55-64 year	40	33.6	68.3±25.48	
	65-74	24	20.2	59.6±29.59	
	75 year and above	14	11.8	30.0±28.14	
Marital status	Married	105	88.2	67.2±27.88	0.064
	Single	1	0.8	50.0	
	Widowed	12	10.1	44.6±28.56	
Educational level	Divorced	1	0.8	75.0	<0.001
	Illiterate	15	12.6	30.7±26.38	
	Elementary education	41	34.5	65.2±26.70	
	High school	28	23.5	68.8±26.02	
Job	High education	35	29.4	75.1±21.26	<0.001
	Unemployed	35	29.4	39.6±30.75	
	Retired	15	12.6	74.0±23.61	
	Self employed	38	31.9	74.3±21.81	
	Government employees	17	14.3	74.1±17.52	
	Civil servant	14	11.8	81.1±8.80	
Income	Less than 1500 NIS	30	25.2	44.7±31.26	<0.001
	1500 - 3000 NIS	52	43.7	67.2±27.83	
	3001- 4500 NIS	24	20.2	81.5±10.88	
	More than 4500 NIS	13	10.9	71.2±21.32	
Comorbidities					
Hypertension	Yes	87	73.1	62.5±28.41	0.137
	No	32	26.9	71.25±28.08	
Diabetes Mellitus	Yes	66	55.5	60.7±28.67	0.076
	No	53	44.5	70.0±27.63	
Dyslipidemia	Yes	100	84.0	62.5±29.20	0.040
	No	19	16.0	77.1±20.90	
Hypercholesterolemia	Yes	105	88.2	63.6±29.41	0.187
	No	14	11.8	74.3±18.17	
Lifestyle					
Smoking	Yes	58	48.7	68.8±25.41	0.140
	No	61	51.3	61.1±30.85	
Coffee consumption	Yes	91	76.5	68.3±27.04	0.016
	No	28	23.5	53.6±30.57	
Previous heart surgery	Yes	28	23.5	45.2±33.73	<0.001
	No	91	76.5	70.9±23.76	

NIS: New Israeli Shekel

Table 2. HRQoL assessed by SF-36 of the study population in the overall population and according to the presence of previous heart surgery.

SF-36 domains	Overall population (n=119)	Previous heart surgery (n=28)	No previous heart surgery (n=91)	P value
	Mean $\pm$ S.D	Mean $\pm$ S.D	Mean $\pm$ S.D	
Physical functioning	70.2 $\pm$ 35.55	46.79 $\pm$ 40.44	77.42 $\pm$ 30.71	<0.001
Role physical	66.0 $\pm$ 47.36	42.86 $\pm$ 50.40	73.08 $\pm$ 44.29	0.003
Role emotional	65.5 $\pm$ 46.93	44.05 $\pm$ 49.73	72.16 $\pm$ 44.24	0.007
Energy fatigue	65.1 $\pm$ 30.24	45.36 $\pm$ 33.39	71.21 $\pm$ 26.57	<0.001
Emotional wellbeing	66.2 $\pm$ 29.40	47.14 $\pm$ 32.81	72.04 $\pm$ 25.74	<0.001
Social Functioning	77.1 $\pm$ 31.15	55.36 $\pm$ 37.18	83.79 $\pm$ 25.79	<0.001
Bodily pain	78.6 $\pm$ 31.03	57.14 $\pm$ 36.57	85.25 $\pm$ 25.95	<0.001
General health	64.8 $\pm$ 28.48	45.18 $\pm$ 33.73	70.88 $\pm$ 23.76	0.001

Table 3. Correlations between previous heart surgery and all domains of HRQoL.

SF-36 domains	Previous heart surgery	
	r	P value
Physical functioning	0.367	<0.001
Role physical	0.272	0.003
Role emotional	0.255	0.005
Energy fatigue	0.364	<0.001
Emotional wellbeing	0.361	<0.001
Social Functioning	0.389	<0.001
Bodily pain	0.386	<0.001
General health	0.384	<0.001

Table 4. Beta estimates and confidence intervals for the association between PHS and all domains of HRQoL in the overall population.

SF-36 domains	Previous heart surgery		
	β	95% CI	P value
Physical functioning	0.017	1.003, 1.031	0.019
Role physical	0.007	0.997, 1.017	0.193
Role emotional	0.006	0.995, 1.016	0.286
Energy fatigue	0.020	1.005, 1.037	0.011
Emotional wellbeing	0.022	1.005, 1.038	0.009
Social Functioning	0.021	1.006, 1.036	0.006
Bodily pain	0.020	1.006, 1.036	0.007
General health	0.023	1.006, 1.041	0.008

Adjusted for age and sociodemographic characteristics (level of education, job and income) . PHS. Previous heart surgery

Table 5. SF-36 scores across previous studies in patients post CABG.

SF-36 domains	Taghipour et al. ¹⁰ n=112 (1 year)	Middel et al. ¹¹ n=256 (6 months)	Figueiredo Neto et al. ¹² n=44 (6 month)	Present study n=119 (1 year)
Physical functioning	74.6 ± 2.60	76.56 ± 21.98	60.3 ± 29.10	70.2 ± 35.55
Role physical	83.3 ± 3.00	63.77 ± 40.66	-	66.0 ± 47.36
Role emotional	86.9 ± 2.80	79.13 ± 36.22	44.2 ± 46.40	65.5 ± 46.93
Energy fatigue	53.4 ± 0.90	67.62 ± 19.57	62.0 ± 18.10	65.1 ± 30.24
Emotional wellbeing	52.0 ± 0.80	78.77 ± 16.50	64.7 ± 17.20	66.2 ± 29.40
Social Functioning	48.3 ± 1.20	80.35 ± 22.80	75.0 ± 18.30	77.1 ± 31.15
Bodily pain	33.0 ± 2.30	80.23 ± 21.93	62.8 ± 29.80	78.6 ± 31.03
General health	47.0 ± 0.90	65.86 ± 19.71	62.0 ± 18.40	64.8 ± 28.48