Quality of life and its related predictors among acute coronary syndrome patients with coronary stents in Ho Chi Minh City, 2022

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ABSTRACT

The health-related quality of life (HRQOL) assessment after coronary stents insertion to issue a very crucial tool for evaluating outcomes. Therefore, we investigated the associations between healthy affect, resilience to improve their health status and thequality of life of patient is improving. A cross-sectional design involving patients with having acute coronary syndrome (ACS) after coronary stents insertion (CSI) and being treated in the hospital in Ho Chi Minh City. The patients (N =210) who came to Tam Duc Heart Hospital for pre- examination during treatment were asked to answerquestionnaires which included SF-36 and resilience-25. The t-test and ANOVA was applied to identify the factors related to quality of life and resilience. Result showed themean score of resilience is 70.2 ± 8.1. The score of physical components summary (PCS) was range from 32.37 to 61.6 and the mean score was 51.0 ± 8.7. For the mentalcomponent summary (MCS) was range from 39.6 to 60.0 with the mean score was 51.0±5.7. Factors including age, gender, marital status, working status, education, duration after stent treatment, experience of hospitalization for stent treatment, numberof stents in patients and regularly take medication were associated with patients' qualityof life. The mean score of quality of life was significantly different between patients' resilience level ($p < 0.05$).

Keywords: Quality of Life, Acute Coronary Syndrome, stents insertion, resilience.

INTRODUCTION

In the word, cardiovascular disease is the leading global cause of death, accounting for more than 17.6 million deaths per year in 2016. Cardiovascular disease (CVD) was the leading cause (43.2%) of deaths attributable to cardiovascular disease in the UnitedState (US) in 2016. CVD, listed as the underlying cause of death, accounted for 840,678deaths in the US in 2016, approximately 1 of every 3 deaths. Especially, heart attacks and coronary heart disease were 2 of the most expensive condition treated in US[1]. Moreover, CVD caused 17.3 million deaths globally. It accounted for 31.5% of all deaths and 45% of all non-communicable disease deaths, more than

twice that caused by cancer, the rate of death is more than 4 million people die from CVD across the continent every year in Europe[2].

In Vietnam, according to data from the National Heart Institute, the rate of CAD has gradually increased over the years. In 1991, the prevalence of CAD was 3%, 6.05% in 1996, and 9.5% in 1999. The mortality rate of CAD accounts for 11 - 36%. CAD is a burden to public health in developing countries including Vietnam[3]. Furthermore, CAD saw for 31% of total deaths in 2016 and the number of CAD deaths reached 58,452 or 11.58% of total deaths in 2017. However, there is no conclusion indicating factors related to the quality of life of patients with ACS after coronary stentings.

Moreover, those studies were carried out in European countries, which have a different culture than Vietnam. Many studies have shown the relationship between factors related to the quality of life of patients with ACS after percutaneous coronary intervention. However, the main studies in Vietnam are still very limited, there are no studies on factors related to the quality of life of patients with ACS after coronary stentings. Therefore, the objective of this study was to determine the quality of life scores, demographic characteristics and factors related to the quality of life among patients with ACS after coronary stentings.

RESEARCH METHODOLOGY

A cross-sectional study was conducted

Research conducted at the Out Department at Tam Duc Cardiology hospital

The sample size in this study included 210 people with ACS after stentingsreexamination treatment at Out Department

Inclusive criteria Including in the study, patients with Percutaneous Coronary Intervention (PCI) must take examination and treatment at the hospital in Ho Chi Minh City. Potential participants also had finished with demographic characteristics, medical record question, and Resilience-25 questionnaire and complete the self- administered SF36. The patients completely agreed to join the study. Data collection from February to March 2021 at Out Department of Cardiology.

The authors of the two questionnaires agreed to be used in this study. Participants with ACS after coronary stentings treated at the Out Department of Cardiology were invited to participate in the study and they agreed to sign the consent form. They were then invited to complete the questionnaire in time from 60-70 minutes. After the questionnaire is completed and rechecked. The data were entered into SPSS 20 softwarefor analysis.

Questionnaire

The demographic characteristics

Age, sex, level of education marital status, residence, employment status.

Medical record question

Duration of stentings, type of treatment, comorbidities, duration post stent.

The resilience-25

The population was then divided into quartiles. For the lowestquartile (i.e. from 1-25% of the general population), the score ranged from 0-73. For the second quartile (i.e. from 26-50%) the scored ranged from 74-82. For the third quartile (51-75% of the population) the score ranged from 83-90. For the highest quartile (76-100% of the population) the score ranged from 91-100[4]. The CD-RISC contains 25 items, all of which carry a 5-point range of responses, as follows: not true at all (0), rarely true (1), sometimes true (2), often true (3), and true nearly all of the time (4). The scale is ratio based on how the subject has felt over the last month. The total score ranges from 0–100, with higher scores reflecting greater resilience. They show its the scale are listed in table 1[5]. In our sample study of 210 patients, the Cronbach's alpha was 0.794.

The quality of life by the SF-36 questionnaire

The research instrument for evaluating the quality of life was the SF-36 questionnaire from The RAND 36 Items Health Survey, Version 1.0 by Vietnamese, which was checked the reliability of SF-36 questionnaire with Cronbach $\alpha = 0.67$ [6]. The SF-36 questionnaire

includes eight sub-scales, that is physical functioning (PF) 10 sentences, role limitations due to physical health problems (RP) 4 sentences, bodily pain (BP) 2 sentences, general health perceptions (GH) 6 sentences, vitality (VT) 4 sentences, social functioning (SF) 2 sentences, role limitations due to personal or emotional problems (RE) 3 sentences and mental health (MH) 5 sentences. Note that all items are scored so that a high score defines a more favorable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are 0 and 100, respectively.

Data analysis

All results were checked the satisfied with the research's criteria and inputted into the SPSS software version 20.0 to analyze the rate and relationships. The types of data were described as the following. Demographic witth data SF-36 (PCS and MCS), Resilience (each domain) witth SF-36 (PCS and MCS), Demographic data, Resilience (Total score) with SF-36 (PCS and MCS), Multiple linear analyses adjusting for the variables showed in univariate analysis were used to determine the predictors of PCS and MCS among ACS patients with stents. Besides, T-test, One-way ANOVA, Multivariable logistical analysis have using.

RESULTS

Demographic characteristics of participants

Table 1 showed that a total of 210 participants with stents were enrolled. The mean age (SD) of the participants was 64 years old and near seventy percentages (68.1%) were male. The participants who come from urban 56.2% and rural 43.8%. Most of them (87.6 %) were married and 68.1% of them is retired. More than fifty percentage (52.8%) received education at least 9 years. 84.3% patients is over 200 USD per month.84.3% participants had received the stent treatment more than 6 months. Given 84.8% participants received one time treatment of coronary artery stent and more than eighty percentage (81.9%) had one or two stents. Most of them regular took medications.

Table 1. *Demographic characteristics, status of resilience and quality of life (n=210)*

Characteristics	n	(%)
Age, y		
<60	61	(29.0)
60-<70	91	(43.3)
≥70	58	(27.6)
Gender		
Male	143	(68.1)
Female	67	(31.9)
Residence		
Urban	118	(56.2)
Rural	92	(43.8)
Marital status		
Single	19	(9.0)
Married	184	(87.6)
Widowed / Divorced	7	(3.3)
Working status		
Working	67	(31.9)
Retired or unemployment	143	(68.1)
Education		
Less than Primary school (≤ 5 years)	0	(0.0)
Junior high school (>5 –≤ 9 years)	99	(47.1)
Senior high school (>9 – ≤ 12 years)	104	(49.5)
Higher than high school (>12 years)	7	(3.3)
Household income		
1,000,000-5,000,000VND/person/month	33	(15.7)
>5,000,000VND/person/month	177	(84.3)
Months after stent treatment		
< 6 months	33	(15.7)
≥ 6 months	177	(84.3)
No. of hospitalization for stent treatment		
One time	178	(84.8)
Two time	20	(9.5)
More than second time	12	(5.7)

Characteristics	n	(%)
Number of stents in patients		
One	80	(38.1)
Two	92	(43.8)
Three	32	(15.2)
More than three	6	(2.9)
Regularly take medication		
No	7	(3.3)
yes	203	(96.7)

Quality of Life of Acute Coronary Syndrome Patients after Coronary Stents Insertion with resilience-25

Table 2 showed the level of resilience score among 210 acute coronary syndrome patients after coronary stents insertion. As a result, the mean score of resilience is 70.2 ± 8.1. According to the Connor-Davidson Resilience Scale cut point, nearly half of patients (43.3%) was middle level of resilience, one-third of patients (31.4%) was higher level of resilience and 25.2% of patients was low level of resilience.

***Table 2**. Participants' resilience (n=210)*

Level of Resilience		Minimum		Maximum	Mean	± SD
CD-25 score			58.0	94.0	70.2	±8.1
	n	(%)				
Low (< 27%,)	53	(25.2)	58.0	62.0	60.3	±1.4
Middle (27 - 73 %)	91	(43.3)	63.0	72.0	69.2	±2.8
Higher (> 73%)	66	(31.4)	74.0	94.0	79.7	±5.2
CD-25: Connor-Davidson Resilience Scale						

Patient's Quality of Life measured by the T-scores of SF-36

Table 3 showed the results of quality of life among 210 acute coronary syndrome patients after coronary stents insertion. As the result, the score of physical componentssummary (PCS) was range from 32.37 to 61.6 and the mean score was 51.0 ± 8.7. For the mental component summary (MCS) was range from 39.6 to 60.0 with the mean score was 51.0±5.7. Meanwhile, the highest mean score was vitality (60.8±6.5), experienced on body pain (58.6±6.1) and the lowest mean score was role emotional (45.2±14.1) and mental health (47.3±5.6).

***Table 3**. The T-scores of SF-36 (n=210)*

Items of Life SF-36	Minimum	Maximum	Mean	±SD
Physical component summary (PCS)	32.37	61.6	51.0	±8.7
Mental component summary (MCS)	39.6	60.0	51.0	±5.7
Physical functioning (PF)	15.12	57.1	45.1	±11.3
Role Physical (RP)	28.0	56.2	45.6	±12.8
Body Pain (BP)	33.8	62.8	58.6	±6.1
General health (GH)	21.9	64.0	50.2	±7.4
Vitality (VT)	44.3	70.4	60.8	±6.5
Social Functioning (SF)	40.9	57.1	53.8	±3.9
Role emotional (RE)	23.7	55.3	45.2	±14.1
Mental Health (MH)	34.5	57.3	47.3	±5.6

The difference in the QoL SF-36 scores (PCS and MCS) between different categories of demographic variables

Table 4 and Table 5 indicated the results of association between the demographic variables and quality of life (both physical and mental component score) among 210 patients with stents. Table 4 showed that PCS was significantly associated with age, gender, marital status, working status, education level, duration after stent treatment, the no. of stents and regular take medication (yes or no) (all p <0.05), while other demographic variables were not. In table 5, MCS was significantly association with age, marital status, working status, education level, the time of hospitalization for stent treatment and the no. of stents, while hile other demographic variables were not.

***Table 4**. The association of PCS with demographic variables (n=210)*

PCS			
Characteristics	**Mean**	**±SD**	**p-value**
Age			
<60 (n=61)	57.6	±5.0	<0.001*
60-<70 (n=91)	50.6	±7.8	
≥70 (n=58)	44.5	±8.0	
Gender			
Male (n=143)	53.0	±7.5	<0.001*
Female (n=67)	46.5	±9.3	
Residence			0.097
Urban (n=118)	50.1	±9.0	
Rural (n=92)	52.1	±8.1	
Marital status (n=61)			0.281
Single/windowed/divorced (n=26)	52.7	±9.5	
Married (n=184)	50.7	±8.5	
Working status			<0.001*
Working (n=67)	57.2	±4.9	
Retired/unemployment(n=143)	48.0	±8.5	
Education			<0.281
≤ 9 years (n=99)	52.7	±9.5	
> 9 years (n=111)	50.7	±8.5	
Household income/person/month			0.351
1,000,000-5,000,000VND (n=33)	49.7	±10.5	
>5,000,000VND/person/month (n=210)	51.2	±8.3	
Months after stent treatment			<0.001*
< 6 months (n=130)	54.2	±6.8	
≥ 6 months (n=80)	45.6	±8.8	
No. of hospitalization for stent treatment			0.675
One time(n=178)	51.1	±8.9	
≥ Two time (n=32)	50.4	±7.4	
No. of stents in patients			0.001*
One (n=80)	51.8	±8.6	
Two (n=92)	52.1	±8.8	
≥ three (n=38)	46.3	±7.0	
Regularly take medication			0.001*
No (n=7)	40.7	±0.0	
Yes (n=210)	51.3	±8.6	
* Significant with p < 0.05			

***Table 5**. The association of MCS with demographic variables (n=210)*

MCS			
Characteristics	**Mean**	**±SD**	**p-value**
Age			
<60 (n=61)	54.7	±3.7	<0.001*
60-<70 (n=91)	50.0	±5.1	
≥70 (n=58)	48.6	±6.4	
Gender			
Male (n=143)	51.4	±5.7	0.123
Female (n=67)	50.1	±5.6	
Residence			0.341

MCS			
Characteristics	**Mean**	**±SD**	**p-value**
Urban (n=118)	50.7	±6.1	
Rural (n=92)	51.4	±5.3	
Marital status (n=61)			0.005*
Single/windowed/divorced (n=26)	53.9	±4.3	
Married (n=184)	50.6	5.8	
Working status			<0.001*
Working (n=67)	54.8	±3.6	
Retired/unemployment (n=143)	49.2	±5.7	
Education level			0.005
≤ 9 years (n=99)	53.9	±4.3	
> 9 years (n=111)	50.6	±5.8	
Household income/person/month			0.224
1,000,000-5,000,000VND (n=33)	49.9	±4.6	
>5,000,000VND/person/month (n=210)	51.2	±5.9	
Months after stent treatment			0.353
< 6 months (n=130)	51.3	±4.1	
≥ 6 months (n=80)	50.5	±7.7	
No. of hospitalization for stent treatment			<0.001*
One time(n=178)	52.0	±5.3	
≥ Two time (n=32)	45.5	±5.0	
No. of stents in patients			<0.001*
One (n=80)	52.5	±5.6	
Two (n=92)	51.6	±5.1	
≥ three (n=32)	46.3	±5.2	
Regularly take medication			0.115
No (n=7)	47.6	±0.0	
Yes (n=210)	51.1	±5.8	
* Significant with p < 0.05			

The association of Resilience level with the quality of lifeTable 6 indicated the difference of resilience level and quality of life among 210 acute coronary syndrome patients after coronary stents insertion at Tam Duc Heart Hospital.The finding indicated that the mean score of quality of life (both physical and mental components) was significantly different between patients' resilience level with p<0.05 (physical component score) and p<0.001 (mental component score). Meanwhile, the mean score of quality of life of middle resilience level was highest one and lowest one was low resilience level for both physical and mental component score.

***Table 6**. The results of Anova between categorical of resilience and quality of life (n=210)*

Resilience level	**PCS**			**MCS**		
	Mean	**±SD**	**p-value**	**Mean**	**±SD**	**p-value**
Low (< 27%, n=53)	48.4	±8.7	<0.044*	49.6	±6.4	<0.001*
Middle (27-73 %, n=91)	52.0	±9.0		52.8	±3.6	
Higher (more than 73%, n=66)	51.6	±7.8		49.7	±6.9	
*Significant with p < 0.05						

Multiple linear regression of the quality of life (PCS and MCS)

All significant variables showed in univariate analysis were put into multivariate linear analyses with stepwise method to determine the predictors of PCS and MCS among ACS patients with stents. In physical quality of life, participants with advancedage, equal to or more 6 months after stent treatmen, retired/unemployment had signoficantly poorer PCS, while participants with regularly take medication had signoficantly higher physical QoL (Table 7).

***Table 7**. The predictors of MCS using the multivariate linear regression with stepwise method*

Variable	β	p-value
Age	-0.242	0.003
Months after stent treatment (reference: < 6 months)		
≥ 6 months	-0.448	<0.001
Regularly take medication (reference: no)		
Yes (n=210)	0.202	<0.001
Working status (reference: Working)		
Retired/unemployment (n=143)	-0.232	0.003
F=52.971; R^2=0.508; Adjusted R^2=0.499		

In terms of mental quality of life, participants with retired/unemployment status, equal to or more than 2 time of hospitalization for stent treatment, more than 9 years of education had significantly poorer MCS (Table 8).

***Table 8**. The predictors of MCS using the multivariate linear regression with stepwise method*

Variable	β	p-value
Working status (reference: Working)		
Retired/unemployment (n=143)	-0.461	<0.001
No. of hospitalization for stent treatment (reference: one)		
≥ Two time (n=32)	-0.328	<0.001
Education level (ref: ≤ 9 years)		
> 9 years (n=111)	-0.196	0.004
F=32.094; R^2=0.319; Adjusted R^2=0.309		

DISCUSSION AND CONCLUSION

The quality of life (PCS and MCS)

In this study, the majority of study participants were female, which is similar to the results of Morel et al. (2008) in the study on treatment adherence of coronary patients [7], and this is in contrast to the study of Rawal et al. (2020) with a more significant number of males than females [8]. The findings showed that the mean score of resilience is high (70.2 ± 8.1), high percentage of patients was middle level (43.3%) and high level (31.4%) of resilience. This result is similar to previous studies. In the study of Yeng et al. (2016), the HRQoL was high after set primary stents in patients with ACS [9].

As the result, the score of physical components summary (PCS) was range from 32.37 to 61.6 and the mean score was 51.0 ± 8.7. For the mental component summary (MCS) was range from 39.6 to 60.0 with the mean score was 51.0±5.7. Meanwhile, the highest mean score was vitality (60.8±6.5), experienced on body pain (58.6±6.1) and the lowest mean score was role emotional (45.2±14.1) and mental health (47.3±5.6).

As for the quality of life of patients with stents, the type of stent inserted did not affect the quality of life of each patient [10]. Patients' quality of life with stent implantation less than six months is gradually improved, while patients' quality of life after six months is almost lower. This finding is similar to the study of Xue et al. (2015), who also confirmed that for patients with stent implantation for six months, quality of life is improved, and then the quality of life

is almost unchanged [11].

PCS was significantly associated with age, gender, marital status, working status, education level, duration after stent treatment, the no. of stents and regular take medication (yes or no) (all p <0.05), while other demographic variables were not. MCS was significantly association with age, marital status, working status, education level, the time of hospitalization for stent treatment and the no. of stents, while hile other demographic variables were not.

The predictors of PCS

In physical quality of life, participants with advanced age, equal to or more 6 months after stent treatmen, retired/unemployment had significantly poorer PCS, while participants with regularly take medication had significantly higher physical QoL. This result is quite similar to the previous study patients aged ≥ 70 years had poorer physical HRQOL (SF-12) and physical limitations (SAQ), but better mental HRQOL (SF-12), angina frequency and QOL (SAQ) at both time points. Age, length of hospital stay, gender, partnership status and number of stents deployed are independent predictors of HRQOL improvement over time [9]. The older patients who had many problems related to health therefore their quality of life is lower than others and in previous study also indicted that age was a significant factor related to the quality of life of patients with heart stents [12]. In opposite, the patients who regularly take medication had better physical quality of life because their health is consistent when they follow the doctor medication.

The predictors of MCS

In terms of mental quality of life, participants with retired/unemployment status, equal to or more than 2 time of hospitalization for stent treatment, more than 9 years of education had significantly poorer MCS. For the mental quality of life, Yeng et al. (2016) also found the length of hospitalization also the predictor of mental quality of life. The patients may get tired from staying long in the hospital with more than 2 times of surgery the health is worse then the mental health is getting bad. Moreover, with the retired or unemployment status, they will get more stress than others because they can't afford for hospitalization. It becomes their family's burden. They may think negatively and hopelessly. Moreover, the patients with higher education may get more anxiety than the less education one because they know about their health status, they can search more information about their disease then they get more worried than someone they do not know anything about their health status and just follow the doctor advice. These results are consistent with the result from previous study that factors related to worse HRQoL were severe symptom experience, higher depression, a lower educational level, and lower social support [13].

Recommendations

On that basis, the study recommends that more attention should be paid to patient health education to help patients participate more in physical activities after stenting. The results also confirm the role of family interest in improving the patient's quality of life after stenting. The analysis of correlations with quality of life indicates that retired patients, married people, and patients with multiple stents are patients with low quality of life who need more attention. Emotional and health education for patients to improve their quality of life.

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