

## Health status and mental health in patients after percutaneous coronary intervention

*Estado de saúde e saúde mental de pacientes após intervenção coronária percutânea*

*Estado de salud y salud mental de pacientes tras intervención coronaria percutánea*

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### How to cite this article:

Richter VC, Coelho M, Arantes EC, Dessotte CAM, Schmidt A, Dantas RAS, Rossi LA, Furuya RK. Health status and mental health in patients after percutaneous coronary intervention. Rev Bras Enferm. 2015;68(4):589-95. DOI: <http://dx.doi.org/10.1590/0034-7167.2015680415i>

Submission: 04-08-2015 Approval: 06-23-2015

### ABSTRACT

**Objective:** to assess the association between perceived health status and the mental health of patients submitted to percutaneous coronary intervention after hospital discharge. **Method:** a quantitative and cross-sectional study involving 101 participants. The following instruments were used: a sociodemographic and clinical characterization instrument, the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), and the Hospital Anxiety and Depression Scale (HADS). Participants were divided into three groups: no anxiety and no depression (G1); anxiety or depression (G2); and both (G3). The ANOVA test was used for the intergroup comparison of means on the SF-36 domains. **Results:** There was an association between perceived health status and mental health. The participants in G1 presented higher scores in all SF-36 domains in comparison with participants in G2 and G3. **Conclusion:** Participants with no anxiety and depression presented better-perceived health status in comparison with those with anxiety or depression, or both.

**Key words:** Quality of Life; Mental Health; Angioplasty.

### RESUMO

**Objetivo:** avaliar a associação entre o estado de saúde percebido e a saúde mental de pacientes submetidos à intervenção coronária percutânea, após a alta hospitalar. **Método:** estudo quantitativo, transversal, com 101 participantes. Os instrumentos utilizados foram: caracterização sociodemográfica e clínica, *Medical Outcomes Study 36-Item Short-Form Health Survey* (SF-36) e Escala Hospitalar de Ansiedade e Depressão (HADS). Os participantes foram divididos em três grupos: sem ansiedade e sem depressão (G1), com ansiedade ou depressão (G2) e com ambos (G3). Para comparação das médias dos domínios do SF-36 entre os grupos, foi utilizado o teste ANOVA. **Resultados:** houve associação entre o estado de saúde percebido e a saúde mental. Participantes pertencentes ao G1 apresentaram maiores escores em todos os domínios do SF-36 quando comparado àqueles pertencentes ao G2 e G3. **Conclusão:** participantes sem ansiedade e depressão apresentaram melhor estado de saúde percebido que aqueles com ansiedade ou depressão, ou ambos.

**Descritores:** Qualidade de Vida; Saúde Mental; Angioplastia.

## RESUMEN

**Objetivo:** evaluar la asociación entre el estado de salud percibido y la salud mental de pacientes sometidos a intervención coronaria percutánea tras el alta. **Método:** estudio cuantitativo, transversal, con 101 participantes. Los instrumentos utilizados fueron: instrumento de caracterización sociodemográfica y clínica, *Medical Outcomes Study 36-Item Short-Form Health Survey* (SF-36) y Escala Hospitalaria de Ansiedad y Depresión (HADS). Los participantes fueron divididos en tres grupos: sin ansiedad y sin depresión (G1), con ansiedad o con depresión (G2) y con ambos (G3). Para comparar los promedios de los dominios del SF-36 entre los grupos, fue utilizado el test ANOVA. **Resultados:** hubo asociación entre el estado de salud percibido y salud mental. Los participantes en G1 revelaron mayores escores en todos los dominios del SF-36 en comparación con aquellos en G2 y G3. **Conclusión:** los participantes sin ansiedad y sin depresión presentaron mejor estado de salud percibido en comparación con aquellos con ansiedad o con depresión, o con ambos. **Palabras clave:** Calidad de Vida; Salud Mental; Angioplastia.

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## INTRODUCTION

Considering data on general mortality, cardiovascular diseases are the main cause of death in Brazil and worldwide. In 2011, in Brazil, circulatory system diseases (Chapter of the International Statistics of Diseases and Health-Related Problems [ICD-10]) accounted for 28.6% of deaths, according to data from the Ministry of Health, totaling 335,213 deaths<sup>(1)</sup>. Of these deaths, 103,486 were from coronary heart disease (CHD), which accounted for 8.8% of deaths in Brazil in 2011<sup>(1)</sup>.

CHD is characterized by a deficiency of blood in the myocardium resulting from the atherosclerotic process in the coronary arteries and it is directly associated with the degree of obstruction. Obstruction reduces blood flow and thus the supply of oxygen to the myocardium. Angina and heart attack are the main manifestations of CHD<sup>(2)</sup>.

Percutaneous coronary intervention (PCI) is an efficient therapeutic option to treat CHD and it can be equated to clinical treatment and heart surgery. More than 60,000 PCI procedures were performed in Brazil in 2006<sup>(3)</sup>.

PCI is a method to reestablish blood flow in the myocardium through the introduction of a balloon-tipped catheter. The balloon is inflated against the narrowing to widen the artery. The use of stents small twisted and expandable stainless steel springs where the balloon is inflated to stabilize the dilated narrowing has been in increased use and is consistent<sup>(3-4)</sup>. Therefore, PCI includes balloon angioplasty (percutaneous transluminal coronary angioplasty), implant of intracoronary stents, and other interventions using catheters to treat coronary atherosclerosis<sup>(3-4)</sup>.

Clinical success of PCI is defined as the relief of myocardial ischemia signs and symptoms resulting in improved quality of life (QoL)<sup>(4)</sup>. QoL is not a clearly defined term due to its different dimensions and because it comprises several aspects of human life, such as physical, emotional, mental, social, and behavioral functioning<sup>(5)</sup>. A term widely used in health literature is health-related quality of life (HRQoL) or perceived health status. The HRQoL evaluates to what extent a health condition or disease affects the life of an individual<sup>(6)</sup>.

The HRQoL is assessed through instruments that are either generic or specific to a given disease. For patients with CHD the main generic instrument used is the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), while the specific one is the Seattle Angina Questionnaire (SAQ)<sup>(6)</sup>.

Depression is commonly reported among patients with CHD, and it is an important risk factor for disease development and severity. The presence of depression is related to a higher risk of cardiac complications such as heart attack, heart failure, and death<sup>(7)</sup>. Moreover, depression contributes to unhealthy lifestyles and lower adherence to treatment which could, in turn, contribute to worse-perceived health status<sup>(7)</sup>.

Anxiety disorders are another important risk factor for patients with CHD. A review of the literature about the impact of psychological factors on the pathogenesis of cardiovascular disease displayed increasing evidence correlating anxiety disorders and the development of cardiac events. Moreover, studies approached in the review showed that individuals suffering from anxiety disorders are prone to unhealthy lifestyles<sup>(8)</sup>.

International studies showed that anxiety and depression are predictive variables for HRQoL among patients with CHD<sup>(9-10)</sup>. However, there are few studies on this subject in developing countries<sup>(11)</sup>. Evaluating the potential correlation between the HRQoL and mental health of patients with CHD in Brazil is important for planning and implementing interventions that are culturally relevant and adjusted for this group of patients.

In the face of the aforementioned, this study aimed to evaluate the association between perceived health status and mental health of patients after PCI, from two to seven months after hospital discharge.

## METHOD

The research project was approved by the Committee of Ethics in Research of the Clinics Hospital of the Ribeirão Preto Medicine College, University of São Paulo (Process HCRP 733/2010). The study objective was presented both in writing and orally to participants. After agreement, participants and the researcher signed the Free and Informed Consent Term (FICT) in two counterparts, as provided for in Resolution 466/12 of the Brazilian Health Council.

It is an observational cross-sectional study. Data were collected in the cardiology and angioplasty outpatient care unit of the Ribeirão Preto Medicine College Clinics Hospital, University of São Paulo. A representative sample was established, and data were collected from May 2011 to June 2012.

The sample comprised 101 patients submitted to PCI and who returned to the outpatient care unit from two to seven

months after hospital discharge. The period of two to seven months was selected because within that period patients should have resumed routine and work activities performed prior to the cardiac event<sup>(3)</sup>.

The inclusion criteria were: 18 years old or older; returned to the outpatient care unit from two to seven months after the PCI; oral and written communication skills; and comprehension of the items comprising the data collection instruments. There was only exclusion criterion: motor disability (for example, use of a wheelchair), because of the influence on questions related to physical activity.

Data were collected through data collection instruments and medical report analysis for one hour, on average. The researcher read the instruments items aloud for the study participants to answer.

In this study the following data collection instruments were used:

- Sociodemographic and clinical characterization instrument comprising the following items: record number in the hospital; date of birth, as well as date of the interview and of the PCI; sex; years of education; marital status; employment status; hospitalization diagnosis; number of PCI sites; previous treatment of heart diseases; existence of co-morbidities (high blood pressure, diabetes, dyslipidemia, and obesity). Moreover, participants were asked if they had a stressful lifestyle.

- Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36): a multidimensional instrument that evaluates the perceived health status or the HRQoL, validated in Brazilian-Portuguese<sup>(12)</sup>. The SF-36 has 36 items pooled in eight domains or components: physical functioning; role-physical; bodily pain; general health; vitality; social functioning; role-emotional; and mental health. Scores range from zero to 100, where zero is the worst perceived health status and 100 the best perceived health status<sup>(12)</sup>. The Cronbach alpha coefficient values for the SF-36 instrument obtained in a recent Brazilian study with CHD patients ranged from 0.71 (general health) to 0.97 (role-emotional), pointing out good internal consistency for that population<sup>(6)</sup>.

- The Hospital Anxiety and Depression Scale (HADS) is a 14-item scale where seven items evaluate depression and seven evaluate anxiety, validated and adapted to Brazilian-Portuguese<sup>(13)</sup>.

Each item is assigned a score ranging from zero to three, and the global interval in each sub-scale ranges from zero to 21 points<sup>(13)</sup>. The higher the value, the more signs of anxiety and depression. Patients were pooled in two groups no case (0-7) and case (8-21) in each sub-scale<sup>(14)</sup>. Patients were further divided into three groups: no anxiety and no depression (G1), anxiety or depression (G2), and both (G3). The validation in Brazilian-Portuguese reached a 0.68 Cronbach alpha to the anxiety sub-scale and 0.77 to the depression sub-scale, suggesting good internal consistency<sup>(13)</sup>.

Data were processed and analyzed using the Statistical Package for Social Science (SPSS) software, version 20.0. Descriptive analyses were performed for simple frequency, position, and dispersion. The variance analysis test (ANOVA), with a 5% significance level, was used for the intergroup comparison of means on the SF-36 domains.

## RESULTS

Considering mental health, most of the participants belonged to the group no anxiety and no depression (G1 = 52.5%). The group with anxiety or depression was the second in prevalence (G2 = 31.7%); 15.8% of participants reported both (G3).

In groups G1 and G2, 50.9% and 71.9% of participants were male, respectively. For G3, in turn, most were women. In all groups most of the participants were married or living in cohabitation. The mean age among groups varied from 58.5 to 60.3 years, and the mean education ranged from four to five years (Table 1).

As regards risk factors in all groups, most participants suffered from high blood pressure and dyslipidemia. Diabetes was more frequent in G3 against G1 and G2, and obesity was more frequent in G2 and G3 compared with G1 (Table 1).

The frequency of patients reporting previous treatment of heart diseases (heart attack, angina, arrhythmia, and heart failure) was higher in G2 and G3. In all three groups, most of the patients had one or two coronary arteries approached by PCI, where the use of stents prevailed (Table 1).

In all groups, most participants considered themselves to have a stressful lifestyle. However, the frequency of patients reporting a stressful lifestyle was higher in G2 and G3 in comparison with G1 (Table 1).

**Table 1 -** Descriptive analysis of sociodemographic and clinical characteristics of participants (N = 101) according to mental health, Ribeirão Preto, São Paulo, Brazil, 2011 - 2012

Variable	G1* (n = 53)		G2* (n = 32)		G3* (n = 16)	
	n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)
Sex						
Male	27 (50.9)		23 (71.9)		4 (25.0)	
Female	26 (49.1)		9 (28.1)		12 (75.0)	
Marital status						
Married/cohabitation	40 (75.5)		26 (81.3)		13 (81.3)	
Widowed	6 (11.3)		2 (6.3)		1 (6.3)	
Divorced	3 (5.7)		2 (6.3)		1 (6.3)	
Single	4 (7.5)		2 (6.3)		1 (6.3)	

Continues

Table 1 (cont.)

Variable	G1* (n = 53)		G2† (n = 32)		G3‡ (n = 16)	
	n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)
Employment situation						
Inactive	40 (75.5)		24 (75.0)		14 (87.5)	
Active	13 (24.5)		8 (25.0)		2 (12.5)	
Age (in years)		60.3 (10.0)		58.5 (12.2)		58.5 (6.3)
Years of education		4.6 (4.1)		4.2 (2.9)		5.2 (4.4)
Presence of co-morbidities (yes)						
High blood pressure	48 (90.6)		31 (96.6)		16 (100.0)	
Dyslipidemia	40 (75.5)		30 (93.8)		15 (93.8)	
Obesity	7 (13.2)		14 (43.8)		7 (43.8)	
Diabetes	19 (35.8)		11 (34.4)		9 (56.3)	
Previous treatment of heart diseases						
No	43 (81.1)		17 (53.1)		8 (50.0)	
Yes	10 (18.9)		15 (46.9)		8 (50.0)	
Number of PCI sites						
1	29 (54.7)		17 (53.1)		7 (43.8)	
2	16 (30.2)		10 (31.3)		8 (50.0)	
3 or more	8 (15.1)		5 (15.7)		1 (6.3)	
Type of PCI						
Stent	48 (90.6)		28 (87.5)		11 (68.8)	
Stent and balloon	5 (9.4)		4 (12.5)		4 (25.5)	
Balloon	0 (0)		0 (0)		1 (6.3)	
Stressful lifestyle (yes)	29 (54.7)		24 (75.0)		13 (81.3)	

Note:

\* no anxiety and no depression;

† anxiety or depression;

‡ both.

**Table 2 -** Average values of the eight SF-36 domains according to mental health and probability values (p) associated with the ANOVA test, Ribeirão Preto, São Paulo, Brazil, 2011-2012

SF-36 Domains	G1* (n = 53)	G2† (n = 32)	G3‡ (n = 16)	p value
	Mean (SD)	Mean (SD)	Mean (SD)	
Social Functioning	88.2 (20.7)	64.0 (28.5)	41.4 (28.0)	<0.001
Mental Health	78.7 (15.8)	52.7 (19.6)	38.0 (17.0)	<0.001
Physical Functioning	77.5 (22.5)	57.9 (27.1)	46.5 (19.2)	<0.001
General Health	74.0 (15.7)	53.8 (18.5)	49.3 (20.2)	<0.001
Vitality	72.7 (19.1)	52.8 (21.9)	35.6 (26.6)	<0.001
Bodily Pain	72.0 (26.0)	45.0 (18.9)	51.6 (27.6)	<0.001
Role-Emotional	70.4 (37.3)	42.7 (39.0)	35.4 (35.4)	<0.001
Role-Physical	53.3 (42.4)	26.6 (34.7)	29.7 (41.0)	0.007

Note:

\* no anxiety and no depression;

† anxiety or depression;

‡ both.

Regarding the evaluation of the association between perceived health status and mental health, individuals belonging to G1 were scored higher in all of the SF-36 domains in comparison with those belonging to G2 and G3. Thus, a better perceived health status was found among individuals with no anxiety and no depression. Differences on mean in all SF-36 domains within the three groups were statistically significant (Table 2).

## DISCUSSION

In this study the group of patients with no anxiety and no depression had better perceived health status when compared with the group of patients with anxiety or depression, or even with the group with anxiety and depression from two to seven months after hospital discharge resulting from PCI. In this way,



results suggest an association between perceived health status and mental health of patients submitted to PCI. Similar results were found in other studies performed in patients with CHD<sup>(9-11)</sup>.

A study performed in Holland with patients submitted to PCI found that 12 months after the procedure the patients with symptoms of anxiety and depression reported a higher risk of worse perceived health status when compared with patients without those symptoms. Moreover, in six of the eight SF-36 domains, the risk for patients with both symptoms (anxiety and depression) to have worse perceived health status was higher in comparison with patients with only depression symptoms<sup>(9)</sup>.

In another study carried out in Austria in patients with CHD, the authors concluded that changes on the HRQoL evaluated one and three months after treatment seem to be more strongly influenced by mental health (anxiety and depression) than by the type of treatment to which patients were submitted (medicinal, PCI, or surgery)<sup>(10)</sup>.

A study<sup>(11)</sup> performed in Brazil in patients with chronic conditions (with CHD or in hemodialysis) revealed that the presence of depression symptoms was predictive of worse HRQoL in all of the SF-36 domains. For the multiple linear regression analysis among all variables studied (social and clinical), depression was the independent variable with higher importance relative to worse HRQoL<sup>(11)</sup>.

Studies with patients in other chronic conditions also found an association between perceived health status and mental health<sup>(15-16)</sup>. In patients with rheumatoid arthritis, depression and anxiety were significantly correlated with HRQoL evaluated through generic (SF-36 and Nottingham Health Profile) and specific (Rheumatoid Arthritis Quality of Life RAQoL) instruments<sup>(15)</sup>. After adjusting the co-variables, depression and anxiety led to the worst HRQoL measures, with statically significant odds ratios (OR)<sup>(15)</sup>.

In a study carried out in Brazil approaching individuals with Parkinson's disease, the perceived health status evaluated through generic (SF-36) and specific (Parkinson's disease Questionnaire PDQ 39 and Scales for Outcomes in Parkinson's Disease-Psychosocial Questionnaire SCOPA-PS) instruments was worse in patients with depression compared with those with no depression, with statistically significant results ( $p < 0.05$ ). Similar results were found when comparing patients with or without anxiety<sup>(16)</sup>.

A study in patients undergoing chronic hemodialysis found an association between perceived health status and physical and psychiatric co-morbidities, notably depression and anxiety. Following were the predictable variables of perceived health status scores in the multiple regression analysis: co-morbidities; depression; anxiety; and health locus of control<sup>(17)</sup>.

Regarding the sociodemographic and clinical characteristics of participants, the larger percentage of women with

symptoms of anxiety and depression (G3) in patients with CHD corroborates the data in the literature<sup>(18-19)</sup>.

A study used the Center for Epidemiological Studies Depression Scale (CESD) tool to evaluate depression among patients submitted to PCI, and more women (43%) reported depressive symptoms than men (29%;  $p < 0.01$ )<sup>(18)</sup>. In another study, the scores for anxiety and depression evaluated by the HADS were also higher among women with CHD in comparison to men. The mean anxiety score was 5.3 (DP = 3.5) among women and 3.3 (DP = 3.1) among men ( $p = 0.03$ ). Regarding depression, the mean for women was 3.8 (DP = 3.2) and for men 2.5 (DP = 2.4) ( $p = 0.07$ )<sup>(19)</sup>.

In our study, diabetes was more frequent in the group with anxiety and depression. Several studies evidenced the association between depression and diabetes<sup>(20)</sup>. These two variables influence the long-term results, including higher risk of mortality among patients submitted to PCI<sup>(4)</sup>.

The highest frequency of obesity in groups with anxiety, depression, or both, supports the data in the literature. The association between these variables could be related to social functioning (fewer social activities) and too few physical activities<sup>(21)</sup>. The association between mental health and obesity increases the risk of metabolic syndrome and the resulting increase in global cardiovascular risk<sup>(22)</sup>.

The limitation of this study is found in its cross-sectional design, which does not allow for assessing the perceptions of perceived health status and mental health in different stages of the individual's life and the path toward becoming a chronic condition.

Anxiety and depression in patients with CHD should be evaluated in the clinical practice, and treatment related to the patients' mental health should be implemented.

Further studies are required to explore the association between perceived health status and mental health in patients with chronic conditions, including CHD. Likewise, another key action is the evaluation of mental health's influence on the severity of heart disease, including increased signs and symptoms such as angina and complications such as restenosis and heart attack. The correlation between mental health and adherence to treatment also deserves to be assessed. Qualitative studies could be performed to explore the understanding about perceived health status or HRQoL and the variables that may be associated with how patients with chronic conditions, including CHD, perceive their HRQoL.

## CONCLUSION

Results show an association between perceived health status and mental health. Those participants in the group with no symptoms of anxiety and depression reported better perceived health status in all SF-36 domains compared with those belonging to the group reporting symptoms of anxiety or depression, or both.

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