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ORIGINAL ARTICLE

Evaluation of social support and medication adherence in patients with coronary artery disease

Avaliação do suporte social e da adesão medicamentosa em pacientes com doença arterial coronariana

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ABSTRACT

Objective: Was to evaluate medication adherence and perceived social support and their association in patients hospitalized for Coronary Artery Disease. **Methods:** Cross-sectional study involving patients hospitalized for Acute or Chronic Coronary Syndrome. Medication adherence was assessed by the Brief Medication Questionnaire and social support by the Medical Outcomes Study Social Support Scale. P-value <0.05 was considered significant. **Results:** Fifty-nine patients were included, of which 50.8% were classified as potential for non-adherence and 37.3% as non-adherent. The perceived social support identified was considered as almost always. Adherent patients and those classified as potential for non-adherence had a higher score in the emotional/informational domain compared to those classified as potential for adherence (p=0.01). **Conclusion:** There was a high prevalence of low medication adherence and high perceived social support scores. Emotional and informational support was associated with the levels of medication adherence.

Descriptors: Social Support; Medication Adherence; Coronary Artery Disease; Nursing.

RESUMO

Objetivo: Avaliar a adesão medicamentosa e o suporte social percebido e sua associação em pacientes hospitalizados por Doença Arterial Coronária. **Método:** Estudo transversal envolvendo pacientes hospitalizados por Síndrome Coronariana Aguda ou Crônica. A adesão medicamentosa foi avaliada pelo *Brief Medication Questionnaire* e o suporte social pela Escala de Apoio Social do *Medical Outcomes Study*. Valor p<0,05 foi considerado como significativo. **Resultados:** Incluídos 59 pacientes, sendo que 50,8% foram classificados como potencial para não adesão e 37,3% como não aderentes. O suporte social percebido identificado foi considerado como quase sempre a sempre. Os pacientes aderentes e aqueles classificados como potencial para não adesão apresentaram maior escore no domínio emocional/informacional quando comparados com aqueles classificados como potencial para adesão (p=0,01). **Conclusão:** Houve alta prevalência de baixa adesão medicamentosa e altos escores de suporte social percebido. O suporte emocional e de informação apresentou associação com os níveis de adesão medicamentosa.

Descritores: Apoio Social; Adesão à Medicação; Doença da Artéria Coronariana; Enfermagem.

1

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

INTRODUCTION

Cardiovascular diseases (CVD) are the main causes of morbidity and mortality in Brazil and worldwide. The manifestations of Coronary Artery Disease (CAD) include Chronic Coronary Syndrome (CCS) and Acute Coronary Syndrome (ACS), responsible for most consultations and admissions in emergency services[1-3].

In 2019, diseases of the circulatory system were responsible for 1,119,006 hospitalizations in Brazil, with a mortality rate of 8.34, and ACS representing 20% of all deaths in individuals over 30 years of age. Despite the decline in this rate in recent decades, Brazil still has one of the highest mortality rates resulting from this cause compared to other countries in the world[4].

For the prevention of new acute coronary events and, consequently, for the reduction of CVD mortality, medication and non-medication adherence, which constitute self-maintenance of health, are the main measures to prevent the recurrence of unstable myocardial ischemic conditions, such as thrombosis or stent or graft stenosis[5].

Several factors can interfere with medication and non-medication adherence. According to the World Health Organization (WHO), these factors comprise five dimensions: related to the patient, to socioeconomic factors, to the disease, to treatment and to the health system and team[6]. Up to 70.7% of patients hospitalized for ACS have at least some previous degree of medication adherence failure[7].

One of the variables that can interfere with medication adherence is social support, defined as "the help and experience of family and friends". Social support incorporates five dimensions: material, related to the provision of resources; affective, related to demonstrations of love and affection; positive social interaction, related to the possibility of having people with whom you can relax and have fun; emotional, regarding the social network's ability to satisfy individual needs in relation to emotional problems; informational, related to the possibility of having people who advise, inform and guide[8].

The results of a meta-analysis on social support and medication adherence in patients with arterial hypertension including data of more than 18,000 patients showed that functional social support was significantly associated with the level of general medication adherence, demonstrating that social interactions interfere with medication adherence[9]. Subsequent studies conducted in the United States of America[10] and Morocco[11] added evidence that social support is an independent predictor of medication adherence in patients with CAD.

However, studies investigating the relationship between medication adherence and social support in patients with CAD have not been identified in the national literature. Since social support can take place in different dimensions and at different levels, the relationship between this variable and medication adherence must be known in the country, in order to provide a foundation for nurses in the choice for the best intervention to promote medication adherence during hospitalization.

The aim of this study was to assess medication adherence and the perceived social support and their association in patients hospitalized for CAD.

METHODS

This is a quantitative, analytical, cross-sectional study. It was conducted in the period of seven months from September 2019 to March 2020 in Cardiology units of a large public university hospital in the city of São Paulo.

The convenience sample included individuals over 18 years of age hospitalized for any manifestation of coronary artery disease (ACS or CCS), of both sexes and using continuous oral, sublingual and/or subcutaneous medications, according to a medical prescription for at least one month, since the instrument used for evaluation of medication adherence is based on questions related to the last month[12,13].

Patients with clinical signs of severe acute ventricular dysfunction (acute pulmonary edema or cardiogenic shock) at the time of data collection and those with a previous diagnosis of dementias and neuropsychiatric diseases identified in the patient's record were not included in this study, because these variables would make it difficult or impossible to answer the instruments used.

Data were collected through a semi-structured interview applied by one of the researchers and by consulting the medical records. The sociodemographic and clinical variables of interest were age, sex, religion, education, comorbidities, medical admission diagnosis and medications of continuous use before hospitalization according to information from the clinical record.

The Brief Medication Questionnaire (BMQ) instrument, originally built in English[12] and validated for Portuguese in 2012[13] was used to evaluate medication adherence. This questionnaire evaluates medication adherence in three domains: regimen, beliefs and recall. The "regimen" domain consists of five questions that evaluate how the patient used each medication in the past week; the "beliefs" domain consists of two questions related to the effectiveness and discomfort caused by the medications used; the "recall" domain consists of two questions related to the number of doses and medications and the difficulty in remembering to take them.

In relation to the Brazilian version, in the analysis of global internal consistency, a Cronbach's alpha value of 0.67 was obtained and in the analysis of each domain, internal

2

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

consistencies of 0.67, 0.84 and 0.76 were obtained for the regimen, beliefs and recall domains, respectively[13].

Answers to the BMQ questions are classified as follows: "adherence", when no answer is positive in any domain; "probable adherence", when there is a positive response in at least one domain; "probable low adherence", when there is a positive response in at least two domains; and "low adherence", when there is a positive response in the three domains[12,13].

The Medical Outcomes Study Social Support Scale (MOS-SSS), developed in a study of 2,987 adults with one or more chronic diseases (arterial hypertension, diabetes mellitus, coronary disease or depression) was used to evaluate social support. This scale was initially developed with five dimensions related to social support, and obtained a better fit with four dimensions, namely: material, affective, emotional/informational and interaction. The MOS-SSS consists of three parts: the first and second parts have two questions about the amount of friends and relatives with whom the patient feels comfortable and can talk about almost everything; and the third part contains 19 questions about how often the patient can count on someone for different activities and aspects. The questions in Part Three have five answer options: 1 ("never"); 2 ("rarely"); 3 ("sometimes"); 4 ("almost always") and 5 ("always"), used to determine the social support score. The higher the score obtained, the greater the perception of social support[7,14].

Data were entered in the SPSS software, version 22.0. Qualitative measures were summarized by means of absolute (n) and relative (%) frequencies. The normality of distribution of quantitative measures was assessed using the Shapiro-Wilk test. Variables with normal distribution were summarized using means ± standard deviations (SD) and variables with nonparametric distribution were summarized by using medians and interquartile ranges. The association between the level of medication adherence with the total score and with the scores for each dimension of the MOS-SSS was assessed by the Kruskal-Wallis non-parametric test with multiple comparisons, since the scores of the instrument had non-parametric distribution. Values of $p < 0.05$ were considered significant.

The project was submitted to and approved by the Research Ethics Committee of the University under opinion No. 3,462,131. All participants were informed about the objectives of the study and those who agreed to participate signed the Informed Consent Form.

RESULTS

Fifty-nine patients were approached and all agreed to participate; 57.60% were male, mean age of 61±11.50 years, minimum of 35 years and a maximum of 83 years, 44.10% of mixed race, 61% Catholics, 39% with incomplete elementary

school and 47.40% had a family income of up to three minimum wages (Table 1).

Table 1. Sociodemographic and clinical characterization of patients with coronary artery disease, n=59.

Variable	Total
Sex n (%)	
Male	34 (57.6)
Female	25 (42.4)
Color n (%)	
Mixed race	26 (44.1)
White	25 (42.4)
Black	8 (13.5)
Religion n (%)	
Catholic	36 (61.0)
Evangelical	13 (22.0)
Others	10 (19.0)
Schooling n (%)	
Illiterate	1 (1.70)
Incomplete elementary school	23 (39.0)
Complete elementary school	10 (16.9)
Incomplete high school	1 (1.7)
Complete high school	16 (27.1)
Graduated	7 (11.9)
Postgraduate studies	1 (1.7)
Family income (minimum wage) n (%)	
Less than 1	8 (13.6)
1 to 3	28 (47.4)
3 to 5	13 (22.0)
5 to 7	7 (11.9)
7 to 9	1 (1.7)
More than 9	2 (3.4)
Marital status n (%)	
Married	33 (55.9)
Single	11 (18.9)
Widowed	8 (13.6)
Divorced	6 (10.2)
Lives with someone	1 (1.7)
Medical diagnosis n (%)	
AMI with ST segment elevation	25 (42.4)
Unstable angina	13 (22.)
AMI without ST segment elevation	12 (20.3)
Chronic coronary syndrome	9 (15.3)

3

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

Table 1. Continuation.

Variable	Total
Comorbidities n (%)	
Arterial hypertension	50 (89.3)
Dyslipidemia	40 (67.8)
Diabetes mellitus	32 (54.2)
Previous acute myocardial infarction	14 (23.7)
Brain stroke	6 (10.2)
Risk factors	
Sedentary lifestyle n (%)	48 (81.4)
Smoking n (%)	34 (57.6)
Number of cigarettes/day, mean±standard deviation	19.6±5.9
Alcohol use n (%)	20 (33.9)
Body Mass Index, mean±standard deviation	28.2±5.0

Table 2. Frequencies of positive responses to questions in the Brief Medication Questionnaire (n=59).

Questions	n (%)
REGIMEN (potential for non-adherence)	55 (93.2)
Did the respondent fail to list (spontaneously) the drugs prescribed in the initial report?	42 (71.2)
Did the respondent interrupt therapy due to delay in medication dispensing or another reason?	14 (23.7)
Did the respondent report any missed days or missed doses?	34 (57.6)
Did the respondent reduce or omit doses of any medication?	48 (81.3)
Did the respondent take any extra doses or medication than prescribed?	11 (18.6)
Did the respondent answer "I do not know" to any of the questions?	21 (35.6)
Did the respondent refuse to answer any of the questions?	0
BELIEFS (barriers to belief)	24 (40.7)
Did the respondent report "it doesn't work well" or "I don't know" when asked about the effectiveness of any medication?	13 (22.0)
Did the respondent name the medications that bother him/her?	19 (32.2)
RECALL (barriers to recall)	52 (88.1)
Does the respondent receive a multiple dose medication regimen (twice or more times/day)?	55 (91.5)
Does the respondent report "a lot of difficulty" or "some difficulty" in recalling to take the medication?	20 (33.9)

Regarding clinical data, the most prevalent clinical comorbidities were systemic arterial hypertension, dyslipidemia and diabetes mellitus. In relation to life habits, sedentary lifestyle and smoking stood out. As for medical diagnosis at admission, there was a higher frequency of acute myocardial infarction (AMI) with ST segment elevation.

Regarding drug treatment, patients had an average of 4.8±2.6 prescription drugs, with an average number of 6.90±4.30 pills per day. Ten patients (16.9%) used subcutaneous insulin and enteral medications and 49 (83.1%) used only enteral medications. As for the responsibility of receiving and purchasing medications, 18 patients (30%) reported being responsible for the medication and 41 (70%) patients reported that family members were responsible for receiving and purchasing medications.

In the "Regime" domain of the BMQ, 81.3% of patients reduced or omitted doses of some medication; in the "Belief" domain, 32,2% named medications that bothered them, and in the "Recall" domain, 91.5% received a multiple dose regimen (Table 2).

With regard to medication adherence, the "Regime" domain had more barriers to adherence, followed by the "Recall" domain. Based on the analysis of the domains, two patients (3.4%) were classified as adherent, five (8.5%) as potential for adherence, 30 (50.8%) as potential for non-adherence and 22 (37.3 %) as non-adherent.

Of the patients classified as potential for adherence, 100% had a barrier in the regimen domain, mainly in relation to failure or omission of some doses. Of those classified as potential for non-adherence, 93% had barriers in the regimen and recall domains and 7% in the belief and recall domains,

and patients classified as non-adherent had a barrier in all three domains.

When crossing the levels of medication adherence with the responsibility for medications, it was identified that no patient was responsible for medication in those classified as adherent, 80% of patients with potential for adherence were responsible for medication, 26.6% of patients with potential for non-adherence were responsible for the medication and 37.5% of non-adherent patients were responsible for their medications, although this described difference had no statistical significance (p=0.07).

As for perceived social support (Table 3), patients had a median of three relatives, with a minimum of 0 and a maximum of 10, and a median of two friends, with a

4

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

Table 3. Score of perceived social support assessed by the Medical Outcomes Study (MOS-SSS) (n=59).

Questions	Median (IQR)
How many RELATIVES do you feel comfortable with and can talk about almost anything?	3.0 (4.0)
How many FRIENDS do you feel comfortable with and can talk about almost anything?	2.0 (4.0)
IF you need, how often you count on someone...	
Material	4.8 (1.0)
a) To help you if you stay in bed?	5.0 (0)
d) To take you to the doctor?	5.0 (1.0)
l) To prepare your meals if you are unable to prepare them?	5.0 (1.0)
o) To help you with your daily tasks if you fall ill?	5.0 (1.0)
Affective	5.0 (0)
e) Who shows love and affection for you?	5.0 (0)
i) Who gives you a hug?	5.0 (0)
t) Who you love and makes you feel wanted?	5.0 (0)
Emotional/Informational	4.3 (2.0)
b) To hear you when you need to talk?	5.0 (1.0)
c) To give you good advice in a crisis situation?	5.0 (2.0)
g) To give you information that will help you understand a certain situation?	5.0 (2.0)
h) In whom to trust or to talk about you or your problems?	5.0 (2.0)
m) From whom you really want advice from?	5.0 (2.0)
p) To share your most intimate fears and concerns?	5.0 (3.0)
q) To give a suggestion on how to deal with a personal problem?	5.0 (3.0)
s) Who understands your problems?	5.0 (1.0)
Interaction	4.3 (2.0)
f) To have fun together?	5.0 (0)
j) With whom to relax?	5.0 (2.0)
n) With whom to distract the head?	5.0 (2.0)
r) To do pleasant things?	5.0 (2.0)

IQR: interquartile range.

minimum of 0 and a maximum of 15. The median score for social support was 4.47 (interquartile range, IQR 1.10), that is, social support was perceived as "almost always" to "always". The domains with higher median values were affective and interaction. The questions with lower scores were "To give a suggestion on how to deal with a personal problem", "To share your most intimate fears and concerns".

There was a significant association between the emotional/informational domain of the perceived social support and the level of medication adherence (Table 4).

In multiple comparisons in pairs by the Kruskal-Wallis test, patients classified as probable adherence had lower scores in the Emotional/Information domain compared to patients classified as adherent (p=0.01) and those classified as probable low adherence (p=0.01).

DISCUSSION

The evaluation of medication and non-medication adherence in patients with chronic noncommunicable diseases has played an important role in public health policies, since they are closely related to clinical decompensations, hospital readmissions, higher hospital costs and mortality[6,15]. Medication adherence, especially in patients with CVD, has an impact on blood pressure control, the incidence of new myocardial ischemic events, the reduction of cardiovascular risk, the number of deaths from CVD and on hospital readmissions[16,17].

To the best of the authors' knowledge, this is the first Brazilian study evaluating different dimensions of social support for patients with CAD by means of a validated instrument and analyzing its relationship with medication adherence. The profile of patients in this study is consistent with the sociodemographic profile of patients affected by CAD[1,2,4] in previous studies — male predominance, aged over 55 years and with multiple comorbidities, considered as cardiovascular risk factors.

There was a low level of medication adherence characterized by regimen and recall barriers, mainly in relation to missed doses, failure to list the drugs and the prescribed multiple dose regimen. Similarities in these data can be identified in previous studies that used the BMQ to evaluate medication adherence in patients with Heart Failure[18] or SAH[19], with a high prevalence of non-adherence and potential for non-adherence. Similar to our study, these researchers investigated medication adherence in the week before hospitalization.

Differently from the findings of the present study, Leslie et al.[16], using the BMQ, found that more than half of patients had good medication adherence (0.7% adherence and 50% potential for adherence) after 30 days of hospital discharge for ACS[16]. This divergence of data was probably a result of performing the evaluation after the need for hospitalization, when the motivation for medication adherence is higher[20]. Furthermore, most patients in the present study failed to list the drugs prescribed in the initial report and reduced or omitted some medication, unlike the study by Leslie et al.[16], in which the greatest barrier to adherence was the multiple

5

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

Table 4. Association between BMQ medication adherence levels with the total score and the social support domains of the MOS-SSS scale (n=59).

	Adherence (n=2)	Probable adherence (n=5)	Probable low adherence (n=30)	Low adherence (n=22)	p value*
Number of relatives Median (IQR)	2.5 (7.5)	2.0 (7.5)	4.0 (3.0)	2.0 (2.5)	0.10
Number of friends Median (IQR)	1.5 (2.0)	2.0 (2.0)	2.0 (4.0)	0.5 (3.2)	0.70
Total score MOSS, Median (IQR)	4.3 (0)	4.4 (1.9)	4.3 (1.1)	4.8 (1.3)	0.66
Material domain	4.7 (0)	4.0 (2.0)	5.0 (1.0)	5.0 (1.0)	0.06
Affective domain	5.0 (2.0)	4.0 (2.0)	5.0 (0)	5.0 (1.0)	0.17
Emotional/Informational domain	5.0 (0)	2.5 (2.0)	4.5 (1.0)	4.2 (2.0)	0.03
Interaction domain	4.5 (1.0)	3.5 (3.0)	4.3 (2.0)	4.5 (1.0)	0.62

IQR: interquartile range; *Kruskal-Wallis test.

dose regimen and the report of ineffectiveness of some medication[16].

These data reinforce the need to implement multidisciplinary interventions to promote medication adherence throughout the continuum of treatment of patients with CAD. Such interventions must be personalized for the main individual barriers[20,21] and consider other factors that can contribute to or hinder adherence, such as the level of social support.

In patients with CAD, the relevance of assessing the level of social support is evidenced by the fact that those with low level of support have a higher risk of death after percutaneous coronary intervention[22]. In the present study, social support was identified as high, especially in the affective and material domains. These data were also identified in other studies that evaluated social support in patients with chronic disease who require the use of continuous medications[23].

Additionally, a significant association was observed between medication adherence and the emotional/informational domain of social support. Patients with probable adherence had lower scores compared to adherent patients although surprisingly, they also had lower scores than those classified as probable low adherence. These data corroborate the findings of other studies in part[9,10]. In a study that evaluated 115 patients with CAD, those who received social support from family or friends, that is, emotional support, had better medication adherence (p=0.01)[10] and the same was also identified in another study that evaluated patients with heart failure, in which the lack of social support, that is, emotional and informational support, was considered a predictor of failure in adherence (p=0.03)[9].

The higher scores in the emotional/informational domain in patients classified as potential for non-adherence compared to those classified as potential for adherence can be explained by the identified frequency of responsibilities regarding medication. In most patients with potential for non-adherence, the family members were responsible for the medication and when the patients were asked about the medications, they did not know how to answer what led them to be classified with a worse level of adherence, although we believe further studies are needed to assess this relationship.

Analyzing the variables that led to the classification of patients in terms of medication adherence, we observed that many patients classified as potential for non-adherence had problems in the domains of regimen and recall and higher scores in social support than those classified as potential for adherence, who in turn, had lower scores on the social support scale and 100% barriers in the recall domain. This difference may be related to the person responsible for the medications, because at lower levels of adherence, there was a higher prevalence of family members or caregivers responsible for the medication. This leads us to infer that patients with lower medication adherence had family members as responsible for providing medications, compared to those classified as having greater adherence.

In the present study, no significant association was identified between the level of medication adherence and the level of material, interaction and affective social support, which contradict the results found in other studies[24,25]. In a sample of 150 patients, those who lived alone had lower adherence to blood pressure control measures[24] and in a study that evaluated patients with hypertension and diabetes mellitus, unintentional failure in medication adherence was associated with insufficient financial resources[25].

Knowing the level of medication adherence and the social support prior to hospitalization for any acute coronary event can be an important indicator for the multidisciplinary team, when they need to select the best type of intervention to promote medication adherence[26]. Our study demonstrated that adherent patients had greater emotional and informational support than those classified as potential for adherence, which

6

Rev. Eletr. Enferm., 2021; 23:66979, 1-8

makes us reflect on the importance of the frequent contact of patients using continuous medications with the health team. Particularly for patients identified by the nurse as having lack or low social support, for whom the periodicity in medical and nursing consultations and in the time of guidelines for medication adherence showed a significant association with better levels of adherence, as described in a study with hypertensive patients[27].

The results of this study must be interpreted in the light of some limitations: the number of patients included may not allow generalizations. The sample was composed mainly of low income and low education people, which can limit the understanding of the impact of these sociodemographic variables on medication adherence and social support. The treatment time for comorbidities was not evaluated, which could influence the level of medication adherence. Since data collection was performed through an interview, the answers may have been influenced by social desirability, that is, some patients may have answered the questionnaires according to what they believed the researcher would have liked.

CONCLUSION

Patients with an acute cardiac event had a high prevalence of non-adherence and potential for non-adherence to medication, especially in relation to the regimen and recall domains, and high perceived social support scores. Patients with a better level of medication adherence had a higher perceived social score in the emotional/informational domain.

The identified results reinforce the relevance of the evaluation of medication adherence together with the evaluation of all dimensions of social support during the hospitalization of these patients, so that educational interventions can be directed to barriers to adherence and to specific dimensions of social support.

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8

Rev. Eletr. Enferm., 2021; 23:66979, 1-8