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ORIGINAL ARTICLE

Impact of valvular heart disease on activities of daily living during the preoperative period

Impacto da doença valvar nas atividades cotidianas de pacientes no período pré-operatório

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ABSTRACT

Objective: to assess the impact of valvular heart disease on the daily life of patients in the preoperative period of heart surgery. **Methods:** we conducted a descriptive cross-sectional study using consecutive sampling. We used the assessment instrument "Impact of Valvular Heart Disease on the Daily Life of Patients", consisting of 14 items divided into four domains: "Physical impact - symptoms", "Impact on activities of daily living", "Social and emotional impact" and "Adaptation to the disease". Each domain is scored and an overall score is calculated based on the sum of all items, ranging from 14 to 350. The higher the score, the more negative the perceived impact. **Results:** 73 patients participated in the study. The domain that obtained the highest mean score was "Impact on activities of daily living" (82.79; SD = 21.35), followed by "Social and emotional impact" (61.24; SD = 22.7). The mean overall score was 210.55 (SD = 51.7). **Conclusion:** the patients rated the impact of valvular heart disease during the preoperative period of heart surgery as negative.

Descriptors: Thoracic Surgery; Preoperative Period; Activities of Daily Living; Nursing; Sickness Impact Profile.

RESUMO

Objetivo: avaliar o impacto da valvopatia no cotidiano dos pacientes em pré-operatório de cirurgia cardíaca. **Métodos:** estudo transversal, observacional, descritivo, com amostra de conveniência. Utilizado o instrumento "Impacto da Doença no Cotidiano do Valvopata", composto por uma questão geral e 14 itens, distribuídos em quatro domínios: "Impacto físico da doença", "Impacto da doença nas atividades cotidianas", "Impacto social e emocional da doença" e "Adaptação à doença". Obtém-se um escore para cada domínio e um escore total, por meio da soma de todos os escores (14 a 350), quanto maior o valor, maior a percepção negativa do impacto. **Resultados:** participaram do estudo 73 pacientes. O domínio "Impacto da doença nas atividades cotidianas" apresentou a maior média (82,79; DP=21,35), seguido pelo "Impacto social e emocional da doença" (61,24; DP=22,7). A média do escore total foi 210,55 (DP=51,7). **Conclusão:** os pacientes avaliaram o impacto da valvopatia como negativo no pré-operatório de cirurgia cardíaca.

Descritores: Cirurgia Torácica; Período Pré-Operatório; Atividades Cotidianas; Enfermagem; Perfil de Impacto da Doença.

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INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in both developed and developing countries. Data from Brazil's national health information system, DATASUS, show that in 2018 there were 357,770 deaths in the country due to diseases of the circulatory system, 87,880 of which in the State of São Paulo[1].

Valvular heart disease accounts for a significant proportion of hospital admissions due to CVD. According to the Global Atlas of Cardiovascular Disease 2000-2016: The Path to Prevention and Control, among the different causes of valvular heart disease, it is estimated that rheumatic fever affected around 33 million people worldwide and was responsible for between 1% and 1.5% (319,400) of CVD deaths[2].

Although there are various types of treatment for valvular diseases, heart surgery may still be the only option in certain cases. In Brazil, DATASUS data show that between January 2015 and March 2020, 39,748 *valve repair* or replacement surgeries were performed, together with 11,803 procedures involving a combination of myocardial revascularization and correction of valve dysfunction[1].

Patients with valvular heart disease can have valve stenosis or valve insufficiency, or a combination of the two. These conditions can affect any of the four heart valves: the mitral valve, the aortic valve, the tricuspid valve and the pulmonic valve. Valvular heart disease can develop into symptoms of heart failure, such dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, coughing, wheezing, hemoptysis, peripheral edema and fatigue, as well as symptoms of arrhythmia and angina. The frequency and intensity of clinical manifestations depend on the affected valve apparatus, type of lesion and disease stage[2-3].

Living with a chronic disease such as valvular heart disease, its symptoms, indications for surgery and the stigma attached to heart disease can result in physical, psychological and social impairment. These conditions mean that patients' perceptions of the impact of the disease/treatment and quality of life, and their behavior in response to valve dysfunction, may differ[3-5].

In view of the above, it is important to carry out a holistic assessment of patients with valvular heart disease. Understanding how patients with valvular heart disease rate the effects of the disease on their lives can help inform perioperative planning, facilitating postoperative recovery and rehabilitation.

Studies investigating the impact of valvular heart disease on patients' lives during clinical treatment were found in the literature. However, studies addressing this impact during the preoperative period were not found[3-5]. We therefore opted to conduct patient assessments during the preoperative period of valve surgery to elucidate the physical, social and emotional effects of valvular heart disease, its impact on activities of daily living, and adaptation to the disease to help plan perioperative care.

In light of the above, the aim of this study was to assess the impact of valvular heart disease on the daily life of patients in the preoperative period of heart surgery.

METHODS

We conducted a descriptive cross-sectional study using a quantitative research design. The study sample consisted of patients admitted to a university hospital in the State of São Paulo for valve surgery between February 2017 and March 2019. This paper follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies.

Consecutive sampling was used to select patients of both sexes aged over 18 years regardless of social class and race admitted for first operation or reoperation valve surgery (*valve repair* or replacement of biological and/or metallic valves). Patients who had been in hospital for more than three days and those with disorientation in space and time were excluded.

Orientation in space and time, which was necessary to be able to respond the questionnaire, was assessed using the following questions: "What is today's date?", "How old are you?", "What day of the week is it?", "What is the name of the place where we are at the moment?"; "What is your full name?" and "What is the name of the city where you were born?"[6]. Patients who were unable to answer three or more questions were excluded.

The following information was collected using individual questionnaires administered on the first to third day after admission and from patient health records: date of birth; date of the interview; sex; marital status; level of education; occupation; monthly family income and number of dependent family members; primary diagnosis (type of lesion and affected valve); weight and height to calculate body mass index (BMI); associated diseases (systemic arterial hypertension, dyslipidemia, diabetes mellitus, heart failure, chronic kidney disease, hypothyroidism); symptoms during the week before admission (dyspnea, fatigue, arrhythmia and angina); habits (current or ex-smoker); prescribed medications; and number of surgeries. Age was calculated based on the date of the interview and date of birth.

Date of birth, sex, primary diagnosis, weight and height to calculate body mass index, associated diseases, prescribed medications and number of surgeries were collected from the patients' health records. All other information was obtained from the patient questionnaire.

The impact of valvular heart disease on patients' daily lives was assessed using an instrument designed[3] and validated[4]

by Brazilian researchers (Impact of Valvular Heart Disease on the Daily Life of Patients) and administered by an interviewer.

The instrument consists of a question about the general impact of valvular heart disease on the patient's life (with answers ranging from very negative to very positive) and two 14-item scales (Part A and Part B). Part A measures the patient's perceptions of the impact of the disease, with each item being answered on a five-point Likert scale ranging from strongly disagree (1 point) to strongly agree (5 points). In Part B, patients are asked to rate each effect mentioned in Part A (regardless of whether or not they experience the effect) on a five-point Likert scale ranging from very negative (1 point) to very positive (5 points)[3].

Item scores are calculated by multiplying the score corresponding to the respective item in Part A by the score for the same item in Part B. Considering that the items are scored from 1 to 5 in both parts, item scores range from 1 to 25. The closer the score is to 1, the lower the perceived impact in relation to each belief, while the closer the score is to 25, the higher the perceived impact[3].

The items are divided into four domains: Physical impact – symptoms (11, 12 and 13), Impact on activities of daily living (5, 7, 9, 10 and 14), Social and emotional impact (2, 3, 4 and 6), and Adaptation to the disease (1 and 8). The score for each domain is the sum of the scores of the corresponding items in each domain.

To calculate the overall score, all the items from Part B and items 1, 5 and 8 from Part A (corresponding to favorable impacts) are reverse scored.

The overall score is the sum of all items, ranging from 14 to 350. The higher the score the more the patient recognizes the negative effects of the disease on his/her life, meaning that these effects are actually perceived to be negative[4].

The study was conducted in accordance with the ethical standards for research involving human subjects set out in National Health Council Resolution 466/12 and was approved by the Research Ethics Committee (approval number 1.904.375, CAAE: 63222116.6.0000.5393). All participants signed an informed consent form.

The data were entered into worksheets (Microsoft Excel 2010) using the double entry method. After checking for errors, the data were transferred to the IBM SPSS software platform, version 22.0 for Windows (SPSS Inc., Chicago, IL, USA). A descriptive analysis of the study variables was performed using simple frequencies for nominal or categorical variables and central tendency (mean and median) and dispersion (standard deviation) for continuous variables.

RESULTS

A total of 207 valve surgeries were performed during the data collection period. One-hundred of the patients had been in hospital for more than three days when contacted by the researcher, 19 showed disorientation in space and time and 15 refused to participate in the study, resulting in a final sample of 73 patients.

The sociodemographic characteristics of the patients are shown in Tables 1 and 2.

Table 1. Characteristics of the 73 patients – sex, marital status and occupation. Ribeirão Preto, SP, Brazil, 2019.

Variable	n (%)
Sex	
Female	42 (57.5)
Male	31 (42.5)
Marital status	
Married/consensual union	51 (69.9)
Separated	6 (8.2)
Widow	6 (8.2)
Single	10 (13.7)
Occupation	
Active	28 (38.4)
Inactive	45 (61.6)

Table 2. Characteristics of the 73 patients – age, level of education, family income and number of dependent family members. Ribeirão Preto, SP, Brazil, 2019.

Variable	Mean (SD)*	Median	Interval
Age (years)	54.42 (14.631)	57.03	23 - 84
Level of education (years)	6.66 (5.011)	5.00	0 - 19
Family income (R$)	2404.34 (1843.653)	1908.00	0 - 8000.00
Number of dependent family members	2.93 (1.417)	3.00	1 - 8

Legend: Mean (SD)* = Mean (Standard Deviation).

Table 3 shows the clinical characteristics of patients, related to valve disease and its symptoms, existence of comorbidities, habits, continuous use of medications and previous valve surgery.

Twenty-two patients (30.1%) reported that the general impact of the disease on their lives was very negative, 33 (45.2%) said that it was negative, nine (12.3%) didn't know,

Table 3. Etiology of the valvular heart disease, affected valve, comorbidities, symptoms reported by patients, BMI, habits, number of operations and use of psychotropic drugs. Ribeirão Preto, SP, Brazil, 2019.

Variables	n (%)
Etiology	
Insufficiency	37 (50.7)
Stenosis and insufficiency	20 (27.4)
Stenosis	16 (21.9)
Affected valve	
Mitral	23 (31.5)
Aortic	25 (34.2)
Mitral + tricuspid	6 (8.2)
Mitral + aortic + tricuspid	6 (8.2)
Tricuspid	2 (2.7)
Mitral + aortic	11 (15.1)
Associated diseases	
SAH*	45 (61.6)
Dyslipidemia	29 (39.7)
Diabetes mellitus	15 (20.5)
Arrhythmia	4 (5.5)
Heart failure	8 (9.1)
CKD**	3 (4.1)
Hypothyroidism	8 (11.0)
Symptoms	
Fatigue	39 (53.4)
Dyspnea	43 (58.9)
Arrhythmia	21 (28.8)
Angina	28 (38.4)
BMI***	
Overweight	31 (42.5)
Normal	23 (31.5)
Class 1 obesity	12 (16.4)
Habits	
Ex-smoker	28 (38.4)
Smoker	7 (9.6)
Number of operations	
First operation	53 (72.6)
Reoperation	20 (27.4)
Use of psychotropic drugs	
Yes	18 (24.7)

Legend: SAH* = systemic arterial hypertension; CKD** = chronic kidney disease; BMI*** = Body Mass Index.

five (6.8%) reported that it was positive and four (5.5%) stated that is was very positive.

Table 4 shows the items of the instrument used to assess the impact of the disease on the daily life of the heart valve patient, as well as an analysis of the central tendency and dispersion of the scores of each item.

Table 5 shows the assessment of the impact of the disease on the patient's daily life, using the global score and the scores by domains.

The findings show that the medians obtained for the domains "Physical impact – symptoms", "Impact on activities of daily living" and "Social and emotional impact", as well as the overall score, were greater than the possible medians, while the median for the "Adaptation to the disease" domain was lower than the possible median.

DISCUSSION

Our findings show that the patients recognize the negative effects of valvular heart disease on their lives, corroborating the findings of other studies conducted in Brazil [3-5].

The means of the "Impact on activities of daily living" and "Social and emotional impact" domains reveal the negative impact of the disease on activities of daily living and its social and emotional effects, while the lower means in the domains "Physical impact – symptoms" and "Adaptation to the disease" reveal that these domains rated better than the others.

With regard to the domain "Impact on activities of daily living", the highest-scoring item was worrying about having a heart problem (item 14), followed by constant fear of what might happen because of the disease (item 7) and physical limitations that affect everyday tasks (item 10). In this regard, it is important to highlight that more than half of the patients reported having dyspnea and fatigue and valve insufficiency, and that the most commonly affected valves were the aortic and mitral valves. The fact that most of participants were inactive suggests that these factors may *greatly compromise* activities of daily living[5-6] and work activities[7].

Valvular heart disease can lead to changes in patients' habits due to difficulties undertaking activities of daily living[8] caused by the symptoms[9]. The most prevalent valve diseases is aortic insufficiency, which is associated with mitral valve lesions[2,5]. This explains why both these valve were damaged in a significant percentage of the sample, exacerbating symptoms and therefore hampering activities of daily living and work activities.

Causes of valvular heart disease vary according de age. In younger individuals, the most common cause is rheumatic heart disease, while in older persons the disease is caused mainly by *senile calcific aortic stenosis*, which also affects other valves[10-11]. The presence of comorbidities in the sample, such as systemic arterial hypertension and obesity, combined with

Table 4. Mean and median scores for each item of the assessment instrument. Ribeirão Preto, SP, Brazil, 2019.

Variable	Mean (SD)*	Median	Obtained interval
Item*			
14. I am worried about my heart problem	20.18 (6.2)	25.0	3 – 25
7. I have felt afraid that something will happen to me ever since I found out I have a heart problem	17.82 (7.4)	20.0	3 – 25
10. I have difficulty doing everyday tasks due to my heart problem	17.67 (7.2)	20.0	3 – 25
3. My heart problem prevents me from working like I did before	17.27 (6.7)	20.0	3 – 25
2. My heart problem has made me dependent on another person	15.89 (7.3)	20.0	3 – 25
11. I have regular shortness of breath due to my heart problem	15.60 (8.2)	20.0	3 – 25
12. I feel very tired due to my heart problem	14.78 (7.7)	16.0	3 – 25
9. I have difficulty sleeping due to my heart problem	14.67 (8.2)	16.0	3 – 25
6. I have felt anguish ever since I found out I have a heart problem	14.47 (7.5)	16.0	3 – 25
4. I get more irritated and annoyed due to my heart problem	13.62 (7.6)	16.0	3 – 25
8. My sex life is the same as it was before I found out I had a heart problem	13.32 (7.1)	10.0	2 – 25
5. I live well with my heart problem	12.45 (7.6)	10.0	1 – 25
13. I have episodes of dizziness due to my heart problem	11.62 (8.1)	9.0	3 – 25
1. I have paid more attention to my health ever since I found out I have a heart problem	11.19 (8.3)	8.0	1 – 25

Legend: *Mean (SD)* = Mean (Standard Deviation).

Table 5. Mean and median domain and overall scores. Ribeirão Preto, SP, Brazil, 2019.

Variável	Média (DP)**	Mediana	Intervalo possível (Mediana do Intervalo)	Intervalo obtido
Domain				
Physical impact - symptoms	42.0 (21.35)	48.0	3 – 75 (39)	9 – 75
Impact on activities of daily living	82.79 (21.35)	86.0	5 – 125 (65)	28 – 125
Social and emotional impact	61.24 (22.7)	64.0	4 – 100 (52)	12 – 100
Adaptation to the disease	24.50 (11.5)	25.0	2 – 50 (26)	4 – 45
Overall score	210.55 (51.7)	220.0	14 – 350 (182)	101 – 320

Legend: *Mean (SD)* = Mean (Standard Deviation).

being an ex-smoker, may exacerbate physical limitations and lead to a progressive worsening of the condition[3,5,9].

The means for the "Impact on activities of daily living" domain reveal negative perceptions of the impact of the disease owing to the physical limitations imposed by the symptoms, which tend to compromise activities of daily living and work activities, potentially affecting patients' social and emotional life.

Despite the relation between physical limitations and the symptoms of valvular heart disease, the score for the "Physical impact – symptoms" domain, which includes dyspnea (item 11), tiredness (item 12) and dizziness (item 13), was lower than that of the "Impact on activities of daily living" domain. This may be because the symptoms were not exacerbated at the time of the interview. However, the occurrence of dizziness was reported by a relatively small number of few participants, contrary to what might be expected given the clinical condition of the patients, in so far as a restricted anterograde blood flow can result in syncope due to reduced cerebral blood flow[12].

The highest-scoring item in the "Social and emotional impact" domain was item 3, which relates to the limitations that affect work activities when compared to life before the disease. In this regard, professional inactivity not only leads to a reduction in family income, but also affects the individual's social life[5]. Although the findings for this domain highlight the social impact of valvular heart disease, the emotional aspects should also be taken into account, bearing in mind

that professional inactivity[7], the inability to support their families and the imminent risk of death from the disease can have a significant emotional impact on patients.

Culturally speaking, the heart is the organ of life and feelings. Valvular heart disease and the imminence of heart surgery are therefore particularly hard to cope with psychologically, causing high levels of anxiety in the preoperative period[13].

The perceived impact of the disease was lower in the domain "Adaptation to the disease" than in the other domains. This domain represents the effects of factors related to coping with and understanding the disease. Negative representations of heart disease are related to difficulties in adhering to treatment, lower quality of life and, consequently, trouble adapting to the disease[14]. A widely used term when talking about adaptation to disease is resilience, which is understood as the ability to cope with a disease, accepting the limitations imposed by the condition and seeking to adapt to the situation and live positively. Resilience is related to an individual's perception of quality of life, enabling the person to control the negative impact of the physical, emotional, social and economic effects of the disease[15].

The mean and median overall scores were 210.55 (SD = 51.7) and 220.0, respectively, revealing that patients clearly perceived the impact of the disease on their lives. This shows that, in both ambulatory and hospital care, specific interventions are essential during the preoperative period to minimize episodes of patient anxiety[16], given that these episodes can compromise rehabilitation and adversely affect patient quality of life after valve surgery.

A review of the literature showed a lack of similar studies investigating the impact of valvular heart disease on patients' daily lives prior to surgery.

Knowledge of the impact of valve disease on patients' daily lives prior to surgery can help promote the delivery of comprehensive perioperative care based on a holistic preoperative patient assessment that takes into account the specific biopsychosocial characteristics of each patient.

The main limitation of this study is the use of consecutive sampling, a non-probability sampling technique. Based on this sample, the results provide a diagnosis of the situation. Another limitation was the relatively small number of participants. However, our results provide an important basis for future longitudinal and experimental studies since they provide a measure of variability.

CONCLUSION

The patients rated the impact of valvular heart disease during the preoperative period of heart surgery as negative.

It is important to consider that patients waiting to undergo heart surgery may feel that they are at the borderline between life and death. If not addressed by the health team, this feeling can be an additional stress factor in the perioperative period, which may heighten the stress response inherent in patients undergoing any type of surgery.

The effects of increased stress are directly related to the general adaptation syndrome. If this response persists, it can adversely affect postoperative recovery.

It is therefore important to promote health education directed at patients and their family, providing information on the disease, surgery and stages of recovery, counselling and answering patients' questions.

Future longitudinal studies should investigate the evolution of the impact of valvular heart disease on patients' lives.

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