

ORIGINAL ARTICLE

## Pre-Operative Depression and Anxiety in Patients Undergoing Open-Heart Surgery

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### ABSTRACT

**Introduction:** Cardiac disease and mental health are two related disorders and often co-exist together. As one of the interventions to manage patients with cardiac diseases, the heart surgical procedure also correlated with depression and anxiety which will interfere with the prognosis. This study aimed to know the incidence of depression and anxiety in patients before undergoing open-heart surgery at Dr. Hasan Sadikin General Hospital (RSHS) Bandung.

**Methods:** This study was a case series using primary data from patients and secondary data from medical records. Subjects were adult patients who will undergo open-heart surgery at RSHS Bandung. Data collection was started from November to December 2019. Variables assessed were depression and anxiety. Demographic profiles (age, gender, occupation, education, and marital status), as well as medical profiles (underlying disease, comorbidity, and type of surgical procedure), were also obtained.

**Results:** Seven subjects will undergo open-heart surgery during the study period. One subject was excluded for returning an incomplete questionnaire. Subjects' age was ranged from 28–58 years with a 1:1 male to female ratio. Subjects were dominated by those who will undergo mitral valve replacement (4 of 6). No subject had depression and anxiety in this study.

**Discussion:** In this study, no incidence of depression and anxiety were found among subjects. The possible explanation for this result was the dominant underlying disease of valvular heart disease which was known to have a lower incidence of psychological disorders compared to coronary artery disease.

**Conclusion:** Depression and anxiety were not found among the subjects of this study.

**Keywords:** anxiety, coronary artery disease, depression, heart disease, open-heart surgery

## ABSTRAK

**Latar belakang:** Penyakit jantung dan kesehatan mental merupakan dua masalah kesehatan yang saling berhubungan dan sering terjadi bersamaan. Sebagai salah satu intervensi dalam penanganan pasien dengan penyakit jantung, prosedur bedah jantung juga berhubungan dengan depresi dan ansietas yang dapat mempengaruhi prognosis. Penelitian ini bertujuan untuk mengetahui kejadian depresi dan ansietas pada pasien sebelum dilakukan prosedur bedah jantung di Rumah Sakit Umum Dr. Hasan Sadikin (RSHS) Bandung.

**Methods:** Penelitian ini merupakan studi kasus dengan menggunakan data primer dari pasien dan data sekunder dari rekam medis. Subjek yang dilibatkan adalah pasien dewasa yang akan menjalani prosedur bedah jantung di RSHS Bandung. Pengambilan data dimulai dari November sampai Desember 2019. Variabel yang dinilai adalah depresi dan ansietas. Profil Demografi (usia, jenis kelamin, pekerjaan, pendidikan dan status pernikahan), serta profil medis (penyakit yang mendasari, komorbid, dan tipe prosedur bedah) juga diperoleh.

**Results:** Tujuh subjek akan menjalani prosedur bedah jantung selama periode penelitian. satu subjek dikeluarkan karena kuisioner tidak lengkap. Usia subjek berkisar antara 28-58 tahun dengan rasio 1:1 antara laki-laki dan perempuan. Subjek didominasi oleh mereka yang akan menjalani penggantian katup mitral (4 dari 6). Tidak ada subjek yang mengalami depresi dan kecemasan dalam penelitian ini.

**Discussion:** Pada penelitian ini, tidak ada insiden depresi dan ansietas yang ditemukan pada subjek. Penjelasan yang mungkin pada hasil penelitian ini adalah penyakit dasar yang dominan pada penyakit katub jantung diketahui memiliki insiden gangguan psikologis yang lebih rendah dibandingkan dengan penyakit arteri coroner.

**Conclusion:** Depresi dan ansietas tidak ditemukan diantara subjek dalam penelitian ini.

**Keywords:** ansietas, bedah jantung, depresi, penyakit arteri koroner, penyakit jantung,

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## INTRODUCTION

Heart disease is included in cardiovascular diseases (CVDs) which are the main causes of death and disability worldwide.<sup>1</sup> The prevalence of heart disease diagnosed by doctors of all ages in Indonesia is 1.5%. West Java Province is included in the top ten provinces with the highest prevalence of heart disease which was exceeding the prevalence at the national level.<sup>2</sup>

Heart disease is often accompanied by mental health disorders.<sup>3</sup> Psychological disorders such

as depression and anxiety affect the mind and all body functions, including the cardiovascular system.<sup>4</sup> Research by Chaddha et al. showed a clear relationship between mental health and heart disease.<sup>3</sup> Depression, anxiety, schizophrenia, and bipolar disorder are risk factors for both the onset and course of CVDs.<sup>5</sup>

Although depression and anxiety are known as risk factors for heart disease, psychological aspects have not received special attention. Depression is known as a predictor of the incidence of heart disease, while anxiety is known as a factor that increases the risk of mortality and morbidity before cardiac surgery procedures.<sup>6</sup> Chaudhury et al. found that heart surgical procedures, particularly coronary artery bypass graft surgery (CABG) are usually associated with depression and anxiety. This procedure could result in adverse side effects for the patient's overall prognosis. Chaudhury et al. also found that in patients undergoing cardiac rehabilitation (CR), anxiety can affect the patient's participation and modify the patient's lifestyle.<sup>7</sup> On the other hand, according to several previous studies, exercise-based CR benefits in decreasing the patient's depression and anxiety scores.<sup>8</sup>

A study conducted by McGrady et al. found that psychological stress such as depression and anxiety complicates the CR program, and not all patients with depression and anxiety completed their CR program. CR is an important program in the management of patients with heart disease which will lead to an increase in overall quality of life. Failure to complete the CR program can increase the risk of recurrence of the underlying disease, decrease quality of life, and increase other complications.<sup>8</sup> Research by Pourafkari et al. showed the incidence of depression and

anxiety in post-cardiac surgery patients was 42.5% and 25%, consecutively. This incidence decreased significantly after the patient followed the CR program.<sup>9</sup>

This study aimed to know the incidence of depression and anxiety in patients who will undergo open-heart surgery in Dr. Hasan Sadikin General Hospital (RSHS). This research is expected to be the basis for improving the CR program for cardiac surgery patients.

## METHODS

This is a case series with the subjects of all patients aged 18 years or older who will undergo open-heart surgery at RSHS Bandung from November to December 2019. The exclusion criteria were medically unstable patients, had cognitive impairment, was not able to communicate well, and refused to be interviewed using a questionnaire.

All patients who will undergo open-heart surgery during this period are taken as research subjects. Socio-demographic data such as age, gender, marital status, occupation, and education, as well as medical data such as underlying diseases, comorbidities, the procedure of open-heart surgery, and depression as well as anxiety scores were taken as subject characteristics. Depression and anxiety were determined using the Zung Self-rating Depression Scale (Z-SDS) and Zung Self-rating Anxiety Scale (Z-SAS) questionnaires.<sup>10,11</sup> These questionnaires were filled out by the patient and accompanied by the researcher. Based on the results of this questionnaire, the subjects will be categorized as normal or have anxiety or depression. Data processing was done using Microsoft Excel and displayed by tables.

**Table 2. Subjects Characteristics Based on Z-SD**

Characteristics	Subjects					
	A	B	C	D	E	F
1 I feel blue and downhearted.	1	2	1	1	1	1
2 I feel the best in the morning.	3	2	3	1	4	1
3 I have crying spells or feel like it.	1	3	1	1	2	2
4 I have trouble sleeping at night.	3	2	2	1	3	2
5 I eat as much as I used to.	3	2	1	1	3	1
6 I still enjoy sex.	3	2	3	3	4	3
7 I realize that I am losing weight.	2	3	2	1	4	1
8 I have trouble with constipation.	1	1	1	1	1	1
9 My heart beats faster than usual.	2	2	2	1	1	2
10 I get tired for no reason.	2	2	1	1	1	1
11 My mind is as clear as it used to be.	4	2	1	1	3	1
12 I find it easy to do the things I used to.	2	2	3	1	3	1
13 I am restless and can't keep still.	2	2	1	1	2	1
14 I feel hopeful about the future.	3	2	1	1	1	2
15 I am more irritable than usual.	2	2	2	1	4	2
16 I find it easy to make decisions.	2	3	2	1	3	1
17 I feel that I am needed and useful.	3	1	1	1	3	1
18 My life is pretty full.	3	2	2	1	1	1
19 I feel that others would be better off if I were dead.	1	1	1	1	1	1
20 I still enjoy the things I used to do.	3	3	1	1	3	1
<b>Total Depression Scores</b>	<b>46</b>	<b>41</b>	<b>32</b>	<b>22</b>	<b>48</b>	<b>27</b>

Table 3 shows the subject's anxiety score with the description of items in the Z-SAS questionnaire. All subjects were included in the normal category or within reasonable limits based on the Z-SAS questionnaire. The highest Z-SAS item score was the 'my hands are usually warm and dry' item, which is a positive point. It can be assumed that the majority of patients rarely or only slightly experienced this complaint before the cardiac surgery was carried out. Other items score

that consistently low was the 'I feel messy and devastated' item which may indicate the subject's mental stability when filling out this questionnaire. In addition, there was also 'my arms and legs are shivering and shaking' item which was consistently at a low score.

The highest score obtained by respondents with Z-SDS questionnaire was 48. This score has a difference of two points with the lower limit of

the category of mild depression, which is 50–59. Each questionnaire has a score range of 20–80. Meanwhile, the highest score obtained by respondents based on the Z-SAS questionnaire was 42, which was obtained by three patients. This score differs by three points with the lower limit of the mild anxiety category, which is 45–59.

**Table 3. Subjects Characteristics Based on Z-SAS**

Characteristics	Subjects					
	A	B	C	D	E	F
I feel more anxious and nervous than usual.	2	2	1	1	2	1
I feel afraid of no reason at all.	1	2	1	1	1	1
I feel panicky or get upset easily.	1	2	2	1	1	1
I feel I'm falling apart and going to pieces.	1	1	1	1	1	1
I feel that nothing bad will happen and everything is all right.	3	2	4	1	3	1
My arms and legs tremble and shake.	1	1	1	1	1	1
I am bothered by headaches, and neck or back pain.	2	4	2	3	3	2
I feel get tired easily and weak.	2	4	2	1	2	1
I feel can sit still easily and calm.	2	2	4	3	3	1
I can feel my heart beating fast.	2	1	2	1	1	2
I am bothered by dizzy spells.	2	2	2	2	4	1
I have fainting spells or feel like it.	1	1	3	1	3	1
I can breathe easily.	2	1	3	1	1	1
I get feelings of tingling and numbness in my fingers & toes.	1	2	1	2	3	1
I am bothered by indigestion or stomach aches.	1	4	2	1	1	2
I have to empty my bladder often.	3	2	3	4	3	4
My hands are usually warm and dry.	4	3	4	3	4	4
My face gets blushes and hot.	1	2	1	1	1	1
I fall get a good night's rest and asleep easily.	3	2	2	1	3	3
I have nightmares.	1	2	1	1	1	1
Total Anxiety Scores	36	42	42	31	42	31

## DISCUSSION

In this study, no incidence of depression and anxiety were found among subjects. In contrast to several previous studies, such as research by Navarro-Garcia et al. which showed higher rate of depression and anxiety in pre-cardiac surgery patients. The rate of depression and anxiety in pre-cardiac surgery patients were 32% and 19%, respectively.<sup>12</sup> Another study by Younes et al. found that the incidence of pre-operative anxiety was 30% and depression was 18%. Symptoms of depression and anxiety decreased at 1 week to 6 months post-operatively.<sup>13</sup>

In the study by Vingerhoets, it was also found that the highest average scores for depression and anxiety were owned by female subjects with scores of  $51.5 \pm 13.6$  and  $10.7 \pm 7.2$ , respectively.<sup>14</sup> In comparison, this study also had higher mean scores of depression and anxiety in females than males sex, with scores of  $43.8 \pm 11.3$  and  $8.2 \pm 6.7$ , respectively. Navarro-Garcia conducted a study on pre-cardiac surgery patients aged 25–83 years. The study included of subjects with advanced age. This is different from this study, where the age range of the research subjects was 28–58 years and all patients were included in the adult category. With a wider age range, Navarro-Garcia found that the age range under 65 years was a determinant of the development of preoperative anxiety, while depressive disorders were found to have a risk factor of the length of hospital stay after surgery.<sup>12</sup> In a study by Rodriguest et al., it was found that there was a difference in different age groups with regard of incidence of depression and anxiety. They found that patients between 65 to 74.9 years presented more symptoms of depression compared to patients between 55

to 64.9. With regard to anxiety, they found that patients between 55 to 64.9 years presented more symptoms compared to patients between 65 to 74.9 years reported. However, these differences were not statistically significant.<sup>15</sup> The results of these studies showed that the effect of age and sex was vary and need to be explored.<sup>12,14,15</sup>

The type of cardiac surgery in this study was predominantly valve replacement. This may be explained the incidence of depression and anxiety. The underlying disease of valvular heart disease was known to have a lower incidence of psychological disorders compared to coronary artery disease. The study by Okamoto et al. described the development of depression and anxiety based on cardiac surgery procedures undertaken by patients. As many as 25% of subjects who were CABG patients experienced anxiety and 21.2% of subjects experienced depression.<sup>6</sup> Meanwhile, in another study, it was found that the degree of depression and anxiety in valve replacement patients was lower than in CABG. This may be because the pathophysiology of valvular heart disease is not influenced by psychological factors, while coronary heart disease is closely related.<sup>16</sup> Research by Botzet et al. concluded that patients with coronary heart disease had higher psychological distress due to the systemic nature of the disease compared to valvular heart disease. It can also be influenced by pathophysiological factors including the inflammatory process and psychological effects.<sup>17</sup> One review found that the prevalence of major depressive episodes was 15-20% in patients undergoing CABG. This review also found that the number of patients experiencing major or minor depression as well as dysthymia in the population undergoing CABG is 20-30%, depending on comorbidities.<sup>18</sup>

This study has several limitations, including the relatively small number of subjects and unspecified measuring instruments for hospital settings and heart disease. Further research should be carried out in an adjusted periods time to obtain a more representative sample size. Research design can be made in analytical form to obtain more significant data processing results. In addition, it is important for future researchers to also consider the instrument to be used. It would be better if the measurement of depression and anxiety variables had been proven adequate to measure the degree of mood disturbance in the pre-operative heart disease setting. Researchers also found that the additional variables assessed could be redeveloped, for example, the variable providing explanations about procedures that could have a major impact on the outcome of depression and anxiety levels in pre-cardiac surgery patients.

## CONCLUSION

This study found that there was no depression and anxiety in patients who will undergo open-heart surgery. Due to some limitation in this study including the small number of study subjects, the result may only applied to this study. Further research is needed with the improvements to the study limitations.

## ETHICS APPROVAL

This study was obtaining ethical clearance from the Research Ethics Commission of Faculty of Medicine Universitas Padjadjaran, number 1149/UN6. KEP/EC/2019. This study also had permission from the Education

and Research Section of the RSHS number LB.02.01/X.2.2.1/1827/2019.

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