

## PREOPERATIVE ANXIETY STATUS OF PATIENTS WITH HIP AND KNEE REPLACEMENT SURGERY

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### ABSTRACT

**Objectives:** This study was conducted to estimate the prevalence of preoperative anxiety status and find out some related factors in hip and knee replacement patients at the Department of Orthopedic Surgery and Sports Medicine, Hanoi Medical University Hospital. **Subjects and Methods:** A cross-sectional study recruited 102 patients scheduled for hip and knee replacement surgery. The research was conducted from June to September 2022. Preoperative anxiety status was measured by the Hospital Anxiety and Depression Scale (HADS). **Results:** The population ages varied from 22 to 92 years (mean age=62.11 ± 15.35 years). Nearly half of patients (48%) experienced preoperative anxiety ranging from mild to severe, with a mean HADS score was 7.21±3.13, and 32% of patients had mild anxiety. Surgical types and gender associated with preoperative anxiety status. The proportion of patients who reported being afraid of intra- and/ or postoperative complications, postoperative disabilities, and the pain was 80.4%, 65.7%, and 58.8%, respectively. **Conclusion:** The proportion of hip and knee replacement surgery patients who experienced preoperative anxiety was high. Surgical types and gender were significantly associated with the preoperative anxiety status of hip and knee replacement surgery patients (p<0.05).

**Keywords:** Hip and knee replacement, the Hospital Anxiety and Depression Scale (HADS), preoperative anxiety.

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### I. INTRODUCTION

Along with the aging of the global population, pathological problems related to joints are increasing. According to the World Health Organization, arthritis diseases of hip and knee joints affect 9.6% of males and 18% of females aged 60 and over.<sup>1</sup> According to a study conducted by Wengler A et al from 2005 to 2011, the United State of America and Germany illustrated an increase in the proportion of hip and knee replacement surgery.<sup>2</sup> Patients who had arthroplasty are becoming younger. The prevalence of total hip replacement at 50 years of age was 0.58% and increased to 3.25% at 70 years, and 5.87% at 90 years of age. It was also true for knee replacement surgery.<sup>3</sup> In the face of pathological problems associated with joints, demand for treatment methods is increasingly a concern. While non-surgical treatments are no longer effective (medications, avoiding strain on the affected joint, physical therapy), joint arthroplasty is one of the most frequent surgical procedures and a very effective treatment option for severe osteoarthritis, significant injury, and other conditions. It helps patients decrease pain and improve physical function.

Anxiety is a common issue faced by patients in the preoperative period. Preoperative anxiety is mentioned to be a normal part of the surgical experience which is described as an unpleasant state of uneasiness or tension. It is secondary to a patient being concerned about a disease,

anesthesia, surgery, or the unknown,<sup>4</sup> and it often appears when the patient is hospitalized waiting for surgery. One day before surgery anxiety is highest.<sup>5</sup> Anxiety influences patients both cognitively and physiologically. Some research also confirmed that preoperative anxiety is associated with increased postoperative anxiety, postoperative pain, and an extended duration of staying in the hospital.<sup>6-9</sup> These adverse effects can lead to lengthening recovery times as well as decreased patient satisfaction with the preoperative experience.<sup>9</sup> Moreover, the results from these surgeries directly affect movement ability, study, and work in the future. It could cause anxiety.

The degree to which each patient shows anxiety which depends on many factors. These include age, gender, type and extent of the proposed surgery, previous surgical, and personal susceptibility to stressful situations.<sup>10</sup> In addition, numerous studies have shown that preoperative anxiety is linked to patients' concern about their general health, uncertainty regarding the result and the fear of postoperative pain, concern about the loss of control over body function, disability, the economic impact of the disease, loss of independence, and death.<sup>11</sup> Uncontrolled related factors can cause increased anxiety status, this is the reason why its predictors should be found out.

The overall prevalence of preoperative anxiety as reported in some previous studies was high both in Vietnam and the world, standing at 94.5% and ranging from 11% to 80%, respectively.<sup>12,13</sup> In Vietnam, there have been several studies that surveyed patients' psychology before surgery.<sup>12,14,15</sup> However, to the best of our knowledge, the number of the survey on preoperative anxiety in patients with hip and knee replacement

surgery was modest. The study aims to survey preoperative anxiety in patients undergoing hip and knee replacement surgery and to find some related factors among patients undergoing hip and knee replacement surgery at the Department of Orthopedic Surgery and Sports Medicine, Hanoi Medical University Hospital.

## II. SUBJECTS AND METHODS

### 2.1. Research subjects

Patients 18 years and older were scheduled for hip and knee replacement surgery at the Department of Orthopedic Surgery and Sports Medicine, Hanoi Medical University Hospital from June, 25<sup>th</sup> 2022 to September, 25<sup>th</sup> 2022.

The inclusion criteria: Patients who were 18 years and older, scheduled for hip and knee replacement surgery, had physical health status enough to answer the questionnaire: ASA I, II, and patients who agreed to participate in the study.

The exclusion criteria: Patients who underwent emergency surgery, were diagnosed with psychiatric illness and did not cooperate fully with researchers.

### 2.2. Research methods

**2.2.1. Study design:** Cross-sectional study.

**2.2.2. Sample size and sample methods:** Sample size was calculated according to the sample size calculator for estimating a single proportion (quote???):

$$n = Z_{1-\frac{\alpha}{2}}^2 * \frac{P*(1-P)}{d^2}$$

With:

- **1- $\alpha$** : Confidence level
- **P**: Anticipated population proportion
- **d**: Absolute precision required on either side of the proportion ( in percentage points)
- **n**: Sample size

The minimum sample size was 97 people with  $\alpha = 0.05$ ,  $Z_{1-\frac{\alpha}{2}} = 1.96$ ,  $p = 0.5$  aimed that  $(1-p)$  is highest, and  $d = 0.1$ . We collected 102 patients.

**2.2.3. Research instrument:** This questionnaire included 6 parts: General information (age, gender, ethnicity, religion, occupation, address, educational level, marital status, and health insurance), disease characteristics (diagnosis, comorbidities, previous surgery, surgical types), preoperative explanation (administrative procedures, patient's condition, surgical methods, anesthesia methods, complications, preoperative preparation), patient's concerns, preoperative pain (VAS), measurement of preoperative anxiety (we used the Vietnamese version of Hospital Anxiety and Depression Scale-Anxiety (HADS-A) <sup>16</sup>. HADS-A consisted of 7 parts to measure anxiety. Score each section on a linker 4 scaled from 0 to 3. 0 (not at all); 1 (occasionally); 2 (a lot of the time); 3 (most of the time). 0-7: None anxiety; 8-10: Mild anxiety; 11-14: Moderate anxiety; 15-21: Severe anxiety)

#### **2.2.4. Data collection:**

- Finding the HADS scale and HADS scale which was translated into Vietnamese.
- Sending it to the supervisor and revising some questions based on the supervisor's suggestion.
- Obtain permission to collect the data from Hanoi Medical University, Hanoi Medical University Hospital, and the Department of Orthopedic Surgery and Sports Medicine.
- Data were collected one day before surgery, while patients were in the hospital ward, all patients who meet the inclusion criteria will be clarified about the research purposes before deciding to participate in the

research and interviewing participants using a designed questionnaire.

- Information will be collected by asking patients directly except for medical diagnosis and comorbidity, which will be collected through electronic medical records.

- After the complication of the questionnaires, we will collect and make sure all the required questions were filled out completely.

#### **2.3. Data analysis**

The data were coded, checked, cleaned, and entered into the IBM Statistical Package for Social Sciences (SPSS) software version 20 for analysis. Descriptive statistics allowed the characteristics of participants. The mean (standard deviation (SD)) and frequency (%) were used as continuous and categorical variables. The Chi-square ( $\chi^2$ ) test was used to check the relationship between demographic characteristics, disease characteristics, preoperative explanation, preoperative pain, and preoperative anxiety status. The significance level was set at  $p \leq 0.05$ .

#### **2.4. Ethics approval**

This study received approval from Hanoi Medical University Hospital management. We obtained full consent from participants before data collection. All identifiable information was recorded to ensure confidentiality. The result of the research was aimed exclusively at improving clinical practice and improving the health of the community, not for any other purpose.

### III. RESULTS

#### **3.1. General information**

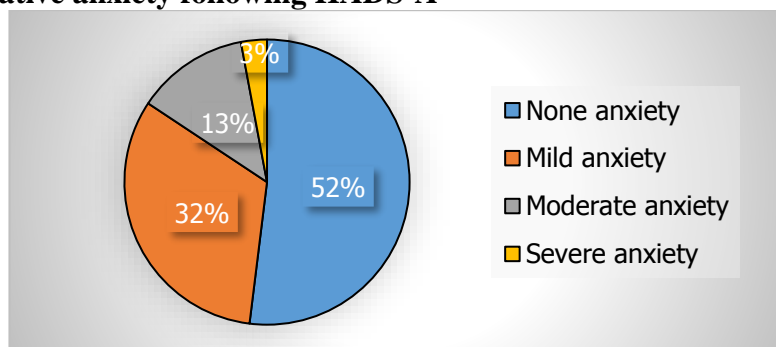
102 patients were invited to participate in this study. Table 1 summarized the demographic characteristics of the study sample.

**Table 1. General information of participants (n = 102)**

Variables		Number of participants (n)	Percentage (%)
Age	< 60	38	37.3%
	≥ 60	64	62.7%
<b>Mean ± SD = 62.11 ± 15.358; min = 22; max = 92</b>			
Gender	Female	53	52%
	Male	49	48%
Ethnic	"Kinh"	100	98%
	Others	2	2%
Religion	Yes	1	1%
	No	101	99%
Address	Countryside/ Mountainous	53	52%
	Town/ City	49	48%
Health insurance	Yes	102	100%
	No	0	0%
Occupation	Student	1	1%
	Officer/ Jobholder	2	2%
	Farmer	38	37.3%
	Worker	5	4.9%
	Retirement	21	20.6%
	Housewife	8	7.8%
	Freelance	27	26.5%
Educational level	No education	0	0%
	General education	78	76.5%
	College/ University	24	23.5%
	Higher education	0	0%
Marital status	Single	5	4.9%
	Married	79	77.5%
	Widowed/ Divorced	18	17.6%

The mean age of the participants was  $62.11 \pm 15.358$  years, the maximum age was 92 years old, and the minimum age was 22 years old. The number of female patients was 53 people (52%), and the figure for male patients was 49 people (48%). The proportion of patients living in the countryside and mountainous areas was 52% (n = 53), while the figure for town and city was lower, with 48% (n = 49). None of the participants did have health insurance.

**3.2. Preoperative anxiety following HADS-A**



**Figure 1. Preoperative anxiety following HADS-A (n=102)**

The percentage of participants with preoperative anxiety was nearly half, at 48%. As can be seen in figure 1, mild anxiety was highest during the preoperative period. The mean preoperative anxiety score following HADS-A was  $7.21 \pm 3.138$ . The lowest and highest scores were 0 and 16, respectively. Patients in the preoperative period were mainly afraid of intra-and/or post-operative complications, accounting for 80.4%.

### 3.3. Factors related to the patient’s preoperative anxiety

- *The association between social-demographic factors and preoperative anxiety*

**Table 2. Association between demographic characteristics and preoperative anxiety (n=102)**

Variables		Anxiety		No anxiety		p-value
		n	%	n	%	
<b>Age</b>	<60 years	20	52.6	18	52.6	> 0.05
	≥60 years	32	50	32	50	
<b>Gender</b>	Female	22	41.5	31	58.5	<b>0.047*</b>
	Male	30	61.2	19	38.8	
<b>Ethnicity</b>	“Kinh”	50	50	50	50	> 0.05
	Others	2	100	0	0	
<b>Religion</b>	Yes	0	0	1	100	> 0.05
	No	52	51.5	49	48.5	
<b>Occupation</b>	Farmer	24	60	16	40	>0.05
	Other	28	45.2	34	54.8	
<b>Address</b>	Countryside/ Mountainous	29	54.7	24	45.3	> 0.05
	City/Town	23	46.9	26	53.1	
<b>Educational level</b>	General	39	50	39	50	> 0.05
	Higher	13	54.2	11	45.8	
<b>Marital status</b>	Married	43	53.8	37	46.2	> 0.05
	Single/Divorce/ Widow	9	40.9	3	59.1	
<b>Health insurance</b>	Yes	52	51	50	49	
	No	0		0		

\*Chi-square test

Male patients were more anxious than female patients over the preoperative period, there was statistically a significant difference based on gender with  $p < 0.05$  ( $p=0.047$ ).

- *The association between disease and surgical characteristics and preoperative anxiety.*

**Table 3. Association between disease characteristics and preoperative anxiety level (n=102)**

Variables		Anxiety		No anxiety		p-value
		n	%	N	%	
<b>Medical diagnosis</b>	Osteoarthritis	18	60	12	40	> 0.05
	Osteonecrosis, fracture	34	47.2	38	52.8	
<b>Comorbidities</b>	Yes	25	55.6	20	44.4	> 0.05
	No	27	47.4	30	52.6	
<b>Previous surgery</b>	Yes	21	53.8	18	46.2	> 0.05
	No	31	49.2	32	50.8	
<b>Surgical Type</b>	Hip replacement	36	45.6	43	54.4	<b>0.043*</b>
	Knee replacement	16	69.6	7	30.4	

\*Chi-square test

My study consisted of two subjects: hip and knee replacement patients, the proportion of hip and knee replacement surgery patients who experienced preoperative anxiety was 45.6% and 69.6%, respectively. This difference was statistically significant, with  $p < 0.05$  ( $p=0.043$ ).

*- The association between preoperative explanation and preoperative anxiety*

**Table 4. Association between preoperative explanation and preoperative anxiety (n=102).**

Variables		Anxiety		None anxiety		p-value
		n	%	n	%	
<b>General information</b>	Yes	42	50	42	50	> 0.05
	No	10	56.6	8	44.4	
<b>Patient's condition</b>	Yes	47	50.5	46	49.5	> 0.05
	No	5	55.6	4	44.4	
<b>Surgical method</b>	Yes	46	50	46	50	> 0.05
	No	6	60	4	40	
<b>Complications</b>	Yes	44	48.9	46	51.1	> 0.05
	No	8	66.7	4	33.3	
<b>Pre-anesthetic</b>	Yes	52	51	50	49	
	No	0	0	0	0	
<b>Previous coagulation disorders</b>	Yes	52	51	50	49	
	No	0	0	0	0	
<b>Clean up</b>	Yes	52	51	50	49	
	No	0	0	0	0	
<b>Nutrition</b>	Yes	52	51	50	49	
	No	0	0	0	0	
<b>Anesthetic</b>	Yes	43	48.3	46	51.7	> 0.05
	No	9	69.2	4	30.8	
<b>Marked the surgical site</b>	Yes	52	51	50	49	
	No	0	0	0	0	

There was no statistically significant difference between preoperative explanation and preoperative anxiety status, with  $p > 0.05$ . 100% of the patients were provided pre-operative preparation before surgery.

*- The association between preoperative pain status and preoperative anxiety.*

**Table 5. Association between preoperative pain and preoperative anxiety (n=102).**

Variables		Anxiety		No anxiety		p-value
		n	%	n	%	
<b>Preoperative pain</b>	Yes	51	50.5	50	49.5	>0.05
	No	1	100	0	0	

A statistically significant difference was not found between preoperative pain status and anxiety over the preoperative period, with  $p > 0.05$ .

**IV. DISCUSSION**

Among 102 patients enrolled in the study, our results confirmed 48% of patients with preoperative anxiety. Patients with mild anxiety accounted for the highest proportion

with 32%, followed by moderate at 13% and severe at 3%. The average anxiety score was  $7.21 \pm 3.138$ , which is lower than the previous study of Cao Do Cuong (the mean anxiety score of digestive surgery patients was  $8.22 \pm$

3.82 and following HADS-A).<sup>15</sup> Although the proportion of patients with preoperative anxiety was quite high, mild anxiety tended to predominate in the anxiety statistics. This result could be explained that nowadays, advanced treatment methods, cutting-edge equipment, and doctors highly skilled physicians lead to the assurance of patients. It could be the reason why they are not as concerned as before when facing orthopedic surgery which directly affects a patient's ability and quality of life in the future.

According to findings from the literature review, there are a variety of different findings on preoperative anxiety and demographic factors. According to David Ryamukaru, in surveys on 152 patients waiting for surgery at Kigali Medical University Hospital, the findings showed an association between age categories and anxiety level<sup>5</sup>. The elderly had less anxiety than the young did. The findings of the study done in Jimma University Specialized Teaching Hospital, South Western Ethiopia indicated that marital status, time of operation, income, preoperative information, and trait anxiety significantly contributed to the prediction ( $p < 0.01$ ).<sup>10</sup> The study done in Pakistan reported that there was a significant correlation ( $p = 0.005$ ) between the level of education and preoperative anxiety in those who had completed an intermediate level of education, and it was predicted that greater education would result in greater anxiety.<sup>17</sup> However, it conflicts with the data presented in our study. There was no evidence of a relationship between social-demographic characteristics (age groups, educational level, living areas, occupations, and marital status) and preoperative anxiety status. This could be due to the uneven distribution of our patients, research participants, research setting, and differences in the assessment tools of anxiety. The mean age of our participants was  $62.11 \pm 15.358$  years, this is

a late adult group (62.7% of patients aged 60 and over), and it is suitable for arthroplasty surgery. In addition, our data suggested that 100 % of participants had health insurance so the economic burden is reduced. Although the majority of patients have general education, with the development of the digital world, looking up information related to a patient's condition on the internet becomes easier, and access is available to everyone.

In our study, males were associated with an increased risk of being in preoperative anxiety ( $p < 0.05$ ). In contrast, this is not in conformity with results of previous studies which have also been reported in the literature: Mitchell<sup>18</sup>, females were significantly more anxious than males on the day of surgery and their anxiety began sooner. This difference could be due to as participants. Furthermore, it could be the result of orthopedic surgery affecting the ability to perform daily activities and future quality of life, and males play a leadership role in the family, therefore, the consequence of surgery influenced their mental life, especially increased anxiety status among male patients.

We reported no significant association between medical diagnosis, comorbidities, previous surgery, and preoperative anxiety status ( $p > 0.05$ ). However, studies by other researchers: a study was done in a Referral Hospital in Rwanda: Preoperative anxiety appears to be associated with medical diagnosis, patients with traumatic injury were higher preoperative anxiety levels, patients undergoing spine surgery had higher anxiety levels than patients with limb surgery ( $p < 0.05$ ).<sup>5</sup> Patients who had at least one prior surgery had low anxiety levels, this suggests that patients who have undergone another surgery earlier were less anxious because they had less "fear of the unknown" or misconception about anesthesia and surgery.

<sup>17</sup> Possibly, our inclusion criteria is hip and knee replacement surgery so any medical diagnosis related to patients leads to joint replacement. The number of patients with comorbidities and without comorbidities is nearly the same. These differences are hard to explain, it could be due to them being explained anesthesia method, surgical method, and preoperative preparation.

Our study indicated a significant association between surgical types and preoperative anxiety ( $p < 0.05$ ). Compared with the results that have been ascertained in other studies, surgeries were associated with preoperative anxiety. In contrast, in some prior studies by Moerman et al,<sup>7</sup> type of surgery was not important in predicting preoperative anxiety. This difference could be explained by the uneven distribution among subjects, the number of hip replacement patients who participated was three times as many as the number of knee replacement patients, and it might be the reason for the wrong conclusion.

There was a difference in anxiety levels between patients who have a preoperative explanation and the figure for patients without a preoperative explanation. However, this finding was no statistically significant difference ( $p > 0.05$ ). It is not in line with some studies such as a study from Pakistan that showed that preoperative explanation was associated with preoperative anxiety, 56% of their patients said that their anxiety would be lessened if the procedure was explained to them in detail.<sup>17</sup> This result could be explained that patients undergoing hip and knee replacement could be affected by various factors. The result of orthopedic effects is movement ability, quality of life, and expense. Also, patients are provided information over the preoperative period. In addition, they are provided a book to explain the disease, surgical method, nutrition, movement after and before surgery, and how

to use assistant equipment. This is demonstrated by our results: 82.4% of the participants were provided information about administrative procedures and relaxation, more than 90% of patients were provided information related to the condition, surgical type, and complications, instructed to complete preoperative procedures, and 100% of the participants were asked about signed the commitment, marked the surgical site, instructed to clean up the body.

A statistically significant difference was not found between preoperative pain and preoperative anxiety status, with  $p > 0.05$ . This is different from some previous studies. It could be due to 99% of participants getting preoperative pain and the proportion of people who get moderate pain is 56.9%, but they are supported by a host of advanced pain relief methods. Moreover, our sample size is small, which could be the cause of the wrong conclusion. This is the reason why nurses should pay more attention to the patient's pain status during the preoperative period.

## V. CONCLUSION

The proportion of hip and knee replacement surgery patients who experienced preoperative anxiety is quite high (48%). According to our findings, surgical types and gender are significantly associated with preoperative anxiety status. However, considering independent predictors of anxiety to estimate each patient's anxiety level is of limited use given the very low predictive capacity of study design, research instrument, and sample size.

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