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EFFECT OF ACUPRESSURE THERAPY ON INSOMNIA IN CORONARY ARTERY BYPASS GRAFT (CABG) PATIENTS

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ABSTRACT

Coronary artery bypass grafting (CABG) is the most common heart surgery, performed to treat blocked coronary arteries that supply blood to the heart muscle. Despite its effectiveness, 30% to 60% of patients after surgery suffer from complications that affect recovery, including sleep disorders such as insomnia and sleep apnea. The current study **aimed** to evaluate the effectiveness of acupressure therapy in alleviating insomnia in a sample of 150 patients after CABG surgery at the National Hospital for Cardiac Surgery in Lattakia and Lattakia University Hospital. **Materials and methods:** According to the quasi-experimental approach, acupressure sessions were applied to the experimental group patients (N=100), on the pressure points selected in the study three times a day during the first week of the patient's presence in the hospital and the application was completed at home at a rate of 14 sessions per week for two months; while the control group (N=50) was left to the hospital routine. Data were collected using the demographic and health data form and the Athens Insomnia Scale (AIS), before and after the application of the interventions and two months after their application. **Results** showed: After one month of applying the interventions, the level of insomnia in 80% of the patients in the experimental group decreased to "mild insomnia", while 60% of the patients in the control group still suffered from "severe insomnia", with statistically significant differences (p=0.000). During the follow-up evaluation, insomnia completely disappeared in 90% of the patients in the experimental group, compared to 50% of the patients in the control group. The study recommends: adopting pressure therapy as a non-pharmacological technique and using it within the care plan for CABG surgery patients, and giving more attention to their sleep disorders in order to reduce complications and thus accelerate recovery. Keywords: pressure therapy, bypass surgery, coronary artery disease, insomnia.

KEYWORDS: Acupressure therapy, bypass surgery, coronary artery disease, insomnia.

INTRODUCTION

Coronary artery bypass grafting (CABG) surgery is the most common therapeutic option for treating advanced coronary artery disease, with approximately 200,000 surgeries performed annually in the United States. In Western European countries, around 62 surgeries are conducted per 100,000 residents. According to global statistics, the number of deaths due to coronary heart disease in Syria in 2021 was approximately 28,203, accounting for 34.16% of all deaths, placing Syria 12th globally. In Latakia, the number of heart surgery patients has significantly increased in recent years, with approximately 450-500 surgeries performed annually at the National Heart Surgery Center.[1][2]

CABG surgery causes several symptoms that emerge during the postoperative period, such as pain at the surgical site, swelling, loss of appetite, shoulder and back pain, in addition to depression, mood swings, and sleep disturbances.[3] Studies have shown that between 30% to 60% of CABG patients experience significant sleep disturbances after surgery, with 40% to 50% suffering from insomnia, which is often associated with pain and psychological stress. Additionally, approximately 50% to 80% of patients experience sleep apnea, highlighting the need for early diagnosis and effective treatment strategies to improve patient recovery.[4] Some studies indicate that sleep disturbances may persist for months, with 68% of patients experiencing insomnia for up to a year.[5]

Acupressure therapy is one of the complementary

methods used to improve sleep, which relies on stimulating specific points in the body known as "pressure points," which promote relaxation and help restore the body's internal balance.[6,7] This therapy has been shown to be effective in stimulating the parasympathetic nervous system and reducing cortisol levels, which helps alleviate insomnia in patients following cardiac surgery.[8] It also helps increase the secretion of serotonin and melatonin, neurotransmitters that play a crucial role in regulating the sleep-wake cycle. Melatonin, in particular, acts as a primary hormone for the onset of sleep, and exposure to acupressure stimulation enhances its secretion, reducing difficulties in falling asleep.[9]

Several studies have addressed the effect of acupressure on insomnia in cardiac surgery patients. In the study by (Simoncini, et al., 2014), aimed at evaluating the effect of acupressure on insomnia in Alzheimer's patients, acupressure was applied to the (HT7 Insomnia Control) point for 8 weeks. The results showed a significant reduction in sleep disturbances, an increase in effective sleep hours, and a decrease in the need for sedative medications.[10] In the study by (Cerrone, et al.,2008), which included 25 patients, 14 of whom had cancer, acupressure was applied to the (HT7) point for two weeks, showing improvements in sleep quality in 60% of the patients, with a more significant effect among cancer patients.[11]

The study by (Wu Yuchi, et al., 2004), aimed at assessing the effect of acupressure on the point behind the ear to improve sleep in dialysis patients suffering from severe insomnia, demonstrated significant improvements in sleep disturbances after 4 weeks of acupressure sessions.[12] The study by (Li, et al., 2024) found that acupressure helps reduce insomnia and improve sleep quality through its calming effects and relaxation enhancement.[13]

These studies highlight the importance of acupressure therapy as an effective complementary intervention in managing insomnia in CABG patients, warranting further research to enhance understanding of its effects and its role in improving patient recovery.

Importance of the Research and Its Objectives

Theoretical Importance: The number of heart patients and coronary artery bypass grafting (CABG) patients in Syria, especially in Latakia, has significantly increased in recent years. Therefore, the care of this group of patients is of utmost importance.

Practical Importance: Sleep disorders have consequences such as delirium, prolonged hospital stays, mortality, weakened immune and nervous systems, delayed wound healing, and other complications. Thus, addressing sleep disorders is essential to prevent the harmful health effects on heart surgery patients, improve recovery, reduce medication needs, and shorten hospitalization periods. The research's importance also lies in contributing to providing a database for future studies for comparison and guidance.

The aim of this research is to: Evaluate the effect of acupressure on insomnia in CABG patients.

Research Hypothesis: CABG patients in the experimental group who undergo acupressure will exhibit lower levels of insomnia compared to patients in the control group, who follow the hospital routine.

Research Methods and Materials

Research Plan: Based on a quasi-experimental design, the study was conducted in the Cardiology Department of the National Heart Surgery Hospital in Latakia and Latakia University Hospital. Data were collected during the period from May 1, 2023, to September 30, 2024.

Sample: Data were collected from 150 patients who underwent CABG, selected via convenience sampling. The patients were randomly assigned to two groups: experimental and control. Inclusion criteria included: age between 25 and 60 years, no surgical complications, and stable vital signs.

Tools: Data were collected by the researcher using two instruments:

First Instrument: Demographic and health data form developed by the researcher, including (age, gender, marital status, education level, employment, and residence).

Health and vital data: Included questions about (body mass index, presence of other chronic diseases, history of myocardial infarction, type of current surgery, type of coronary disease, current medications, number of sleep hours, daily sleep timing, history of previous surgeries, exercise habits).

Second Instrument

Athens Insomnia Scale developed by (Soldatos, et al., 2000) for self-assessment of insomnia severity based on diagnostic criteria in the International Classification of Diseases.[14]

The questionnaire consists of eight items: sleep onset, nocturnal awakenings or early morning waking, total sleep duration, satisfaction with sleep quality, comfort, duration and frequency of insomnia complaints, distress associated with insomnia, and the impact of insomnia on daily performance. The patient records responses on a Likert scale that indicates how sleep difficulties have affected them in the past month. The response scores range from (0) meaning no problem, (1) mild impact, (2) significant problem, (3) severe sleep difficulties (serious problem). The minimum score is (0) and the maximum score is (24). A score of (6) is considered the cutoff point distinguishing patients with insomnia from those

without. The insomnia levels are categorized as: 7 12: Mild insomnia, 13-18: Moderate insomnia, 19-24: Severe insomnia

Procedures

Approval for conducting the research was obtained from Latakia University and the National Heart Surgery Hospital management after explaining the research objectives.

The first research instrument was developed by the researcher, and the second instrument was translated into Arabic and reviewed by an English expert for retranslation to ensure content accuracy. The instruments were reviewed by a panel of experts from the Faculty of Medicine and Nursing to check the content validity and appropriateness for the study's goal, with modifications made based on their suggestions. The reliability of the second instrument was tested using Cronbach's Alpha coefficient, which was 0.81.

The instruments were tested for content validity by experts from the Faculty of Medicine and Nursing, with adjustments made based on their recommendations.

A pilot study was conducted on six patients from the study population to test the clarity of the instruments, and necessary adjustments were made, excluding these patients from the sample.

A random sample was selected from the cardiac surgery department at the National Heart Surgery Hospital, ensuring they met the inclusion criteria. The sample was randomly divided into two groups: experimental and control, with each experimental patient paired with a control patient.

After obtaining patient consent for participation, the researcher explained the study's purpose and the right to refuse or withdraw at any time, as well as the right to access results. After patient consent, the researcher explained the acupressure procedure steps and conducted a pre-assessment where the patient answered the research tools. Acupressure sessions were applied to pressure points three times a day during the first week of the patient's hospital stay after being transferred from intensive care.

After discharge, patients received two daily sessions with a two-hour gap between sessions, and they were instructed to continue sessions at home for the following three weeks, receiving 14 weekly sessions for a month. At the end of the acupressure sessions (after one month), a post-assessment was immediately conducted by having patients complete the second research tool again. Two months after completing the acupressure sessions, a follow-up assessment was conducted for both experimental and control groups to evaluate sleep quality. **Acupressure Therapy Application Plan: Six pressure points were selected for acupressure**

Main Points: Located on both sides of the neck. To locate them, place a finger behind each earlobe and move the fingers directly behind the bony prominence.

HT7: Method: Slightly bend the hand forward, find the crease, and press on the outer part of the crease, near the little finger side.

SP6 (San Yin Jiao): Located on the inner part of the leg above the ankle. Measure four finger widths above the ankle and apply deep pressure just behind the bone.

LV3 (Tai Chong): Located where the skin of the big toe connects to the next toe.

KD3 (Taixi): Located just above the heel on the inner side of the foot.

Yin Tang[6]: Located between the eyebrows, just above the nose. Pressing this point may help alleviate insomnia and other problems.

Data Analysis: After data collection under the supervision of a statistician, the data were analyzed using SPSS V25 statistical software: Descriptive statistics: Mean, Standard Deviation (SD), frequency (N), and percentage (%). Chi-square test (Ch2) for comparing differences in proportions between the study groups regarding demographic, health, and vital data. Independent samples T-test for comparing the average sleep quality between the experimental and control groups during the study evaluations. Paired sample t-test for comparing the average sleep quality within the same group before and after the interventions. Statistical significance was considered at a p-value ≤ 0.05 (*), and highly significant at a p-value ≤ 0.01 (**).

RESULTS AND DISCUSSION

Results

Table 1: Distribution of Sample Individuals According to Demographic Data.

P value	χ^2	50 Control		100 Experimental		Variables	
		%	N	%	N		
0.089	2.885	**56.0**	**28**	**70.0**	**70**	Male	Gender
		44.0	22	30.0	30	Female	
0.800	0.064	28	14	30	30	40-Less than 50	Age (years)
		72	**36**	**70**	**70**	60 -50	
-	-	100	50	100	100	Married	Marital Status
0.131	10.968	10	5	0	0	Literate only	Educational Level
		14	7	20	20	Primary & Intermediate	
		66	**33**	**70**	**70**	Secondary	
		10	5	10	10		
0.138	14.308	20	10	10	10	Employee	Occupation
		20	10	30	30	Retired	
		60	**30**	**40**	**40**	Self-employed	
		0	0	20	20	Unemployed	

X^2: Refers to the Chi-square test (χ^2, Chi-square). P: Represents the statistical significance level

Table 1 presents the distribution of the sample according to demographic data. It is observed that the majority of participants are male (70% in the experimental group, 56% in the control group). Additionally, the highest proportion of participants falls within the 50-60 age group (70% in the experimental group, 72% in the control group), and all participants in both groups are married (100%). Regarding the educational level, the highest percentage of participants hold a secondary school certificate (70% in the experimental group, 66% in the control group). Furthermore, the majority of participants are self-employed (40% in the experimental group, 60% in the control group). There are no statistically significant differences between the patients in both groups concerning demographic data, as the significance level is greater than ($p<0.05$) for all variables, indicating that the study sample is homogeneous.

Table 2: Distribution of the Sample According to Health Data.

P value	χ^2	Control 50		100 Experimental		Categories	Variables
		%	N	%	N		
0.569	1.000	40	20	40	40	18.5-24.9	Body Mass Index (BMI)
		60	**30**	**60**	**60**	25-29.9	
0.572	1.000	40	20	40	40	Diabetes	*Chronic Diseases
0.163	0.298	60	30	50	50	Hypertension	
0.009**	**0.011**	40	20	20	20	Hyperlipidemia	
0.015*	**0.031**	0	0	10	10	Digestive problems	
0.015*	**0.031**	0	0	10	10	Kidney problems	
0.105	14.61	40	20	10	10	Yes	Previous Myocardial Infarction
		60	30	90	90	No	
0.918	3.864	**50**	**10**	**80**	**8**	Inferior	Type of Previous Infarction
		50	10	20	2	Inferior	
0.375	0.709	**66**	**33**	**70**	**70**	Single	Type of Bypass Surgery
		34	17	30	30	Double	
-	-	100	50	100	100	Aspirin	Medications
0.000**	**21.42**	80	40	100	100	Clopidogrel	
-	-	100	50	100	100	Lopressor	
-	-	100	50	100	100	Atorvastatin	
0.000**	**21.42**	80	40	40	40	Captopril	
0.077	0.125	80	40	90	90	Antibiotics	
-	-	100	50	100	100	Paracetamol	
-	-	100	50	100	100	Plavix	
0.077	0.125	20	10	10	10	Sedatives	
0.569	1.000	**60**	**30**	**60**	**60**	Yes	Smoking
		40	20	40	40	No	
0.115	15.00	50	15	31.67	19	One pack	Number of Cigarettes

		0	0	33.33	20	One and a half packs	
		50	15	25.00	15	Two packs	
		0	0	10.00	6	Hookah (Shisha)	

X²: Refers to the Chi-square test (χ^2, Chi-square). P: Represents the statistical significance level.

Table 2 presents the distribution of the sample according to health data. It is observed that the majority of participants (60% in the experimental group, 60% in the control group) have a Body Mass Index (BMI) between **24.9-29.9**, indicating overweight, with no statistically significant differences between the two groups. Regarding chronic diseases, there are statistically significant differences between the two groups among patients with **hyperlipidemia, digestive problems, and kidney problems** (**p=0.009, p=0.015, p=0.015**). Additionally, the majority of participants **did not** experience a previous myocardial infarction (90% in the experimental group and 60% in the control group), with **no statistically significant differences** between the two groups (**p=0.105**). Regarding the type of previous myocardial infarction, **there are no statistically significant differences** between the two groups (**inferior infarction was observed in 80% of the experimental group and 60% of the control group, p=0.918**). Concerning the type of bypass surgery, the majority of participants underwent a **single bypass surgery** (70% in the experimental group vs. 60% in the control group), with **no statistically significant differences** between the two groups (**p=0.375**). Regarding medications, **there are highly significant statistical differences** between the two groups concerning **clopidogrel and captopril**, with a statistical significance level of **p=0.000**. However, there are **no significant differences** between the two groups regarding **smoking and the number of cigarettes**, as the statistical significance level is **p>0.05**.

Table 3: Distribution of the Sample According to Vital Data.

χ^2 P value	Control 50 %	Control 50 N	100 Experimental %	100 Experimental N	Categories	Variables
2.250 0.325	**40**	**20**	**40**	**40**	Less than 7 hours	Number of Sleep Hours Before Surgery
	20	10	30	30	7 hours	
	40	20	30	30	More than 7 hours	
0.861 0.478	38.0	19	40	40	Fixed	Daily Sleep Schedule
	62.0	**31**	**60**	**60**	Irregular	
0.056 0.813	**60**	**30**	**90**	**90**	Less than 7 hours	Number of Sleep Hours After Surgery
	40	20	10	10	7 hours	
	0	0	0	0	More than 7 hours	
0.832 0.466	**78**	**39**	**80**	**80**	No	Do You Exercise?
	22	11	20	20	Yes	
0.081 0.776	100	11	100	20	Walking and Gardening	Type of Exercise
0.359 0.211	**62**	**31**	**70**	**70**	No	Previous Surgery
	38	19	30	30	Yes	
13.240 0.021*	26.31	5	33.33	10	Gynecological (Cesarean section, Hysterectomy, Ovarian cyst removal)	Type of Surgery
	15.79	3	26.67	8	Orthopedic (Fracture, Joint replacement)	
	31.58	**6**	**40.00**	**12**	Neurological (Herniated disc, Nerve decompression)	
	10.53	2	0	0	Ophthalmic (Glaucoma, Lens replacement)	
	15.79	3	0	0	Gastrointestinal (Gallbladder, Appendectomy)	

X²: Refers to the Chi-square test (χ^2, Chi-square). P: Represents the statistical significance level.

Table 3 presents the distribution of the sample according to vital data. It is observed that **there are no statistically significant differences** between the two groups regarding **the number of daily sleep hours before surgery**, as **40% of patients in both groups** slept **less than 7 hours**, with a significance level of **p=0.325**. Similarly, regarding **the daily sleep schedule**, **there are no statistically significant differences** between the two groups, as **60% of patients in the experimental group and 62% in the control group** had **an irregular sleep schedule**, with a significance level of **p=0.478**. Regarding **the number of sleep hours after surgery**, the majority of participants slept **less than 7 hours** (**90% in the experimental group and 60% in the control group**), with **no statistically significant differences** (**p=0.813**). Regarding **exercise**, the majority of

participants **did not engage in physical activity**, with **80% of the experimental group and 78% of the control group** being non-exercisers, showing **no significant difference** between the two groups (**p=0.466**). Among those who exercised, **walking and gardening** were the only types of physical activity practiced (**100% of exercisers in both groups**), with **no statistically significant differences** between the groups (**p=0.776**).

Regarding **surgical history**, **70% of the experimental group and 62% of the control group** had **no previous surgeries**, with **no statistically significant difference** between the two groups (**p=0.211**). However, **neurological surgery** was the most common type of previous surgery in both groups (**40% in the experimental group and 31.53% in the control group**), with a **statistically significant difference** between the two groups (**p=0.012**).

Table 4: Comparison of the Mean Scores of the Insomnia Scale Between the Experimental and Control Groups Across the Study Assessments.

Follow-Up Assessment		Post-Assessment		Pre-Assessment		Group	Variable
t/p value	mean±SD	t/p value	mean±SD	t/p value	mean±SD		
8.60	0.402±0.20	**4.055**	0.603±1.20	7.801	0.948±2.10	Experimental	Sleep Onset
0.000**	0.404±0.80	**0.000****	0.495±1.60	0.065	0.990±2.80	Control	
4.96	0.492±0.40	**5.485**	0.541±1.10	0.000	0.492±1.60	Experimental	Nighttime Awakenings
0.000**	0.404±0.80	**0.000****	0.495±1.60	1.000	0.495±1.60	Control	
8.60	0.402±0.20	**10.729**	0.461±1.30	5.098	0.644±2.30	Experimental	Early Awakening
0.000**	0.404±0.80	**0.000****	0.000±2.00	0.261	1.030±2.60	Control	
7.66	0.302±0.10	**5.485**	0.541±1.10	6.521	0.492±2.60	Experimental	Total Sleep Duration
0.001**	0.495±0.60	**0.000****	0.495±1.60	0.088	1.370±2.52	Control	
3.66	0.461±0.30	**15.706**	0.449±1.00	5.217	0.492±2.40	Experimental	Overall Sleep Quality
0.000**	0.495±0.60	**0.000****	0.000±2.00	0.055	1.370±2.60	Control	
2.65	0.402±0.20	**4.055**	0.603±1.20	5.217	0.492±2.40	Experimental	Sense of Restfulness
0.000**	0.495±0.40	**0.000****	0.495±1.60	0.119	1.370±2.60	Control	
2.65	0.402±0.20	**6.083**	0.603±0.80	5.566	0.835±1.90	Experimental	Function (Mental and Physical)
0.000**	0.495±0.40	**0.000****	0.495±1.40	0.200	1.107±1.80	Control	
0.00	0.667±0.60	**8.110**	0.674±1.50	0.930	0.402±2.80	Experimental	Daytime Sleepiness
0.000**	0.495±0.60	**0.000****	0.495±1.60	0.354	1.370±2.55	Control	

Level of Significance (p value ≤ 0.05)Level of Significance (p value ≤ 0.01)

Table 4 compares the mean scores of the Insomnia Scale between the experimental group and the control group across the study assessments. For **sleep onset**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.10±0.948 vs. 2.80±0.990) with (t=7.801, p=0.065). However, statistically significant differences were found during the **post-assessment** (1.20±0.603 vs. 1.60±0.495) with (t=4.055, p=0.000). Significant differences remained during the **follow-up assessment** (0.20±0.402 vs. 0.80±0.404) with (t=8.60, p=0.000). For **nighttime awakenings**, there were no statistically significant differences between the two groups during the **pre-assessment** (1.60±0.492 vs. 1.60±0.495) with (t=1.000, p=0.000). Statistically significant differences emerged during the **post-assessment** (1.10±0.541 vs. 1.60±0.495) with (t=5.485, p=0.000). The differences remained statistically significant during the **follow-up assessment** (0.40±0.492 vs. 0.80±0.404) with (t=4.96, p=0.001). For **early awakening**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.30±0.644 vs. 2.60±1.030) with (t=5.098, p=0.261). Statistically significant differences were observed during the **post-assessment** (1.30±0.461 vs. 2.00±0.000) with (t=10.72, p=0.000). The differences continued to be statistically significant during the **follow-up assessment** (0.20±0.402 vs. 0.80±0.404) with (t=8.60, p=0.000). For **total sleep duration**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.60±0.492 vs. 2.52±1.370) with (t=6.521, p=0.088). Statistically significant differences emerged during the **post-assessment** (1.10±0.541 vs. 1.60±0.495) with (t=5.48, p=0.000). These differences continued to be statistically significant during the **follow-up assessment** (0.10±0.302 vs. 0.60±0.495) with (t=7.66, p=0.001). For **overall sleep quality**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.40±0.492 vs. 2.60±1.370) with (t=5.21, p=0.055). Statistically significant differences were found during the **post-assessment** (1.00±0.449 vs. 2.00±0.000) with (t=15.70, p=0.000). The differences remained statistically significant during the **follow-up assessment** (0.30±0.461 vs. 0.60±0.495) with (t=3.66, p=0.001). For **sense of restfulness**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.40±0.492 vs. 2.60±1.370) with (t=5.21, p=0.119). Statistically significant differences were observed during the **post-assessment** (1.20±0.603 vs. 1.60±0.495) with (t=4.05, p=0.000). These differences remained statistically significant during the **follow-up assessment** (0.20±0.402 vs. 0.40±0.495) with

(t=2.65, p=0.001). For **daytime sleepiness**, there were no statistically significant differences between the two groups during the **pre-assessment** (2.80±0.402 vs. 2.55±0.370) with (t=5.93, p=0.354). Statistically significant differences were found during the **post-assessment** (1.50±0.674 vs. 1.60±0.495) with (t=8.11, p=0.000). The differences remained statistically significant during the **follow-up assessment** (0.60±0.667 vs. 0.60±0.495) with (t=0.00, p=0.000). For **sleep satisfaction**, there were no statistically significant differences between the two groups during the **pre-assessment** (1.80±0.876 vs. 1.60±0.495) with (t=5.990, p=0.294). Statistically significant differences emerged during the **post-assessment** (1.80±0.756 vs. 2.40±0.667) with (t=4.967, p=0.000). The differences continued to be statistically significant during the **follow-up assessment** (2.60±0.492 vs. 2.80±0.404) with (t=2.483, p=0.014). For **overall sleep quality score**, there were no statistically significant differences between the two groups during the **pre-assessment** (45.50±6.101 vs. 41.60±13.196) with (t=6.927, p=0.651). Statistically significant differences emerged during the **post-assessment** (32.90±5.550 vs. 35.60±7.131) with (t=2.548, p=0.012). The differences continued to be statistically significant during the **follow-up assessment** (20.80±4.646 vs. 24.00±4.140) with (t=4.481, p=0.000).

Table 5: Comparison of Insomnia Levels Between the Experimental and Control Groups Across the Study Assessments.

X^2/**P value**	**Control**		**Experimental**		**Group**	
	%	**Count**	**%**	**Count**	**Insomnia Categories**	**Assessment**
48.21 0.125	40	20	0	0	No Insomnia	Pre-assessment
	20	10	50	50	Mild Insomnia	
	40	**20**	**50**	**50**	Severe Insomnia	
44.25 **0.000****	0	0	10	10	No Insomnia	Post-assessment
	40	20	**80**	**80**	Mild Insomnia	
	60	**30**	10	10	Moderate Insomnia	
0.03 **0.015***	**100**	**50**	**90**	**90**	No Insomnia	Follow-up
	0	0	10	10	Mild Insomnia	
0.33/0.742	**31.14/0.000****		t/p		Pre-post	
27.92/0.000**	**28.15/0.000****		t/p		Post-follow-up	
5.52/0.000**	**44.88/0.000****		t/p		Pre-follow-up	

*Significance level (p value ≤0.05) **Significance level (p value ≤0.01)

Table 5 shows the comparison of insomnia levels between the experimental and control groups during the study assessments. During the pre-assessment, it is observed that half of the patients in the experimental group (50%) had severe insomnia, while 40% of patients in the control group had severe insomnia, with no statistically significant differences between the two groups (X2=48.21, p=0.125).

During the post-assessment, one month after implementing the interventions, it is observed that most of the patients in the experimental group (80%) had mild insomnia, while 60% of the patients in the control group had severe insomnia. The differences in insomnia levels between the two groups were statistically significant (X2=44.25, p=0.000). During the follow-up assessment, three months after implementing the interventions, it is noted that the majority of patients in the experimental group (90%) no longer had insomnia, and all patients in the control group were also free of insomnia. The differences in insomnia levels between the two groups were statistically significant (X2=0.03, p=0.015). Within the experimental group, there were statistically significant differences in insomnia levels between the pre- and post-assessment (=31.14, p=0.000 t), between the post-assessment and follow-up (=28.15, p=0.000 t), and between the pre-assessment and follow-up (=22.24, p=0.000 t). Within the control group, the table shows no statistically significant differences in insomnia levels between the pre- and post-assessment (=0.33, p=0.742 t), between the post-assessment and follow-up (=27.92, p=0.000 t), and between the pre-assessment and follow-up (=5.52, p=0.000 t).

Table 6: Differences in Insomnia Levels Among Sample Participants According to Demographic Data During Post-Assessment.

X^2 **P value**	**Control Group**		**Experimental Group**		**Insomnia**	**Variable Categories**	**Variable**
	%	**العدد**	**%**	**العدد**			
-	0	0	100	30	Mild	40 Less than 50	Age (in years)
30.36 0.000**	0	0	14.3	10	No Insomnia	50-60	
	40	20	71.4	50	Mild		
	60	30	14.3	10	Moderate		
27.42 0.000**	40	20	85.7	60	Mild	Male	Gender
	60	30	14.3	10	Moderate		

-	0	0	33.3	10	No Insomnia	Female	
	0	0	66.7	20	Mild		
-	100	10	0	0	Moderate	Literate	Educational Level
13.33 0.000**	50	10	100	20	Mild	Primary School	
	50	10	0	0	Moderate		
34.28 0.000**	0	0	14.3	10	No Insomnia	Secondary School	
	0	0	71.4	50	Mild		
	100	10	14.3	10	Moderate		
-	100	10	100	10	Mild	College or University	
44.25 0.000**	0	0	10	10	No Insomnia	Married	Marital Status
	40	20	80	80	Mild		
	60	30	10	10	Moderate		
-	100	10	100	10	Mild	Employee	Employment
60.00 0.000**	0.0	0	33.3	10	No Insomnia	Retired	
	0.0	0	66.7	20	Mild		
	100	30	0	0	Moderate		
3.125 0.077	100	10	75	30	Mild	Self-employed	
	0	0	25	10	Moderate		
-	0	0	100	20	Mild	Unemployed	

*Significance level (p value ≤0.05) **Significance level (p value ≤0.01)

Table 6 shows the differences in insomnia levels between the experimental and control groups according to demographic data during the post-assessment. It is observed that there are statistically significant differences in sleep quality levels between the two groups of patients in the age group (50-60) years, where about three-quarters of patients in the experimental group (71.4%) have mild insomnia, while the highest percentage of patients in the control group (60%) have moderate insomnia, with statistical significance (p=0.000). There are also statistically significant differences in sleep quality levels between male patients in both groups, where most patients in the experimental group (85.7%) have mild insomnia, while the highest percentage of patients in the control group (60%) have moderate insomnia, with statistical significance (p=0.000).

Regarding education level, differences in insomnia levels are observed between patients in both groups with a primary education certificate. All patients with primary education in the experimental group (100%) have mild insomnia, while half of the patients with a primary education certificate in the control group (50%) have moderate insomnia, with statistical significance (p=0.000). Statistically significant differences are also observed among patients with secondary education, where about three-quarters of patients with a secondary education certificate in the experimental group (71.4%) have mild insomnia, while all patients with the same education level in the control group (100%) have moderate insomnia, with statistical significance (p=0.000). There are also statistically significant differences based on marital status, where most married patients in the experimental group (80%) have mild insomnia, compared to 60% of married patients in the control group who have moderate insomnia, with statistical significance (p=0.000). Regarding employment, statistically significant differences are observed between retired patients in both groups, where most retired patients in the experimental group (80%) have mild insomnia, while all retired patients in the control group (100%) have moderate insomnia, with statistical significance (p=0.000). Post-coronary artery bypass grafting (CABG) care steps are crucial for improving outcomes and reducing potential complications on both the psychological and physical aspects, such as sleep disorders and insomnia, which hinder recovery and affect quality of life.[15] The aim of the current study was to evaluate the effect of acupressure therapy on insomnia in patients who underwent CABG. The current study indicated, as shown in Table (1), that there were no significant demographic differences between the experimental and control groups, which is essential for minimizing the impact of external variables on the results.

Table (2) shows that the majority of the participants in the study had an increased body mass index (BMI) in the range of (25-29.9), which reduces the effect of this variable on the final outcomes. The presence of some chronic diseases with statistically significant differences (such as hyperlipidemia and gastrointestinal issues) may suggest the potential influence of these conditions on recovery or sleep quality; however, the homogeneous distribution of other diseases facilitates the comparison of the therapeutic intervention's impact. The results in Table (3) showed a significant similarity between the experimental and control groups in terms of vital data, as no significant differences were observed in the number of sleep hours before and after surgery, daily sleep timing, or exercise practices.

Table (4) compares the mean scores of the insomnia scale items between the experimental and control groups during study evaluations, noting: Sleep onset: No

significant differences were found between the two groups in the pre-assessment, but significant differences appeared in the post-assessment and follow-up, with the experimental group showing a marked improvement compared to the control group. Night awakenings: No significant differences in the pre-assessment, but in the post-assessment and follow-up, the experimental group showed notable improvement compared to the control group. Early awakenings: No significant differences in the pre-assessment, but significant improvements were noted in the post-assessment and follow-up for the experimental group compared to the control. Total sleep duration: No significant differences in the pre-assessment, but the experimental group showed significant improvement in the post-assessment and follow-up. Overall sleep quality: No significant differences in the pre-assessment, but marked improvement was observed in the experimental group compared to the control group in the post-assessment and follow-up. Sense of restfulness: No significant differences in the pre-assessment, but the experimental group showed noticeable improvement in the post-assessment and follow-up. Mental and physical function: No significant differences in the pre-assessment, but the experimental group demonstrated notable improvement in the post-assessment and follow-up. Daytime drowsiness: No significant differences in the pre-assessment, but the experimental group exhibited marked improvement in the post-assessment and follow-up.

These results suggest that the interventions provided to the experimental group were effective in improving various aspects of sleep and reducing insomnia after coronary artery bypass surgery. This improvement is attributed to the intervention provided to the patients through the application of acupressure, which can be explained by its physiological and neurological effects, contributing to muscle relaxation, reducing the physiological stress response, and enhancing the regulation of the sleep-wake cycle.

These findings align with the results of a study by (Li, et al., 2024) titled "Effectiveness of Auricular Acupressure in Treating Insomnia: A Systematic Review and Meta-Analysis." The goal of the study was to evaluate the effectiveness of auricular acupressure in treating insomnia through a systematic review and meta-analysis of available studies on this topic. Several studies using auricular acupressure to treat insomnia were included in the review. The data analyzed showed that auricular acupressure had a positive effect on improving sleep quality and reducing insomnia severity, especially on deep sleep levels and total sleep duration. Improvements in anxiety and stress symptoms were also observed in participants who underwent auricular acupressure therapy.[13]

The current results are also consistent with those of (Nordio & Romanelli., 2008), published in the *Department of Medical Physiopathology, University of Rome 'Sapienza'* journal. The aim of this study was to evaluate the effect of acupressure on the HT7 point (located on the wrist) in improving insomnia symptoms in patients, considering the potential role of melatonin (the sleep hormone). The results showed a significant improvement in sleep quality, including reduced sleep onset time, increased deep sleep, and fewer night awakenings. Moreover, levels of melatonin were found to increase after applying acupressure to the HT7 point, suggesting that melatonin might play a role in enhancing the effectiveness of the therapy for improving sleep.[16]

In contrast, the study by (Hayes & Robinson., 2004) Was conducted in the UK aimed to examine the impact of acupressure on chronic insomnia. The study found that acupressure did not significantly improve sleep quality in patients with chronic insomnia, despite some minor improvements in certain patients in the experimental group. However, there was no significant difference between the acupressure group and the control group regarding insomnia levels or sleep time.[17]

Table (10) compares the level of insomnia between the experimental and control groups during different stages of evaluation (pre-assessment, post-assessment, and follow-up). The results indicate that the treatment was particularly effective in the experimental group, with significant improvements in insomnia levels compared to the control group. Notably, the improvement continued during the follow-up phase, suggesting a sustained effect of the treatment. This long-term improvement can be attributed to the neurological and hormonal effects of acupressure, such as reducing cortisol (the stress hormone) levels and increasing melatonin secretion, thereby improving sleep quality over time.

Similarly, (Zheng, et al., 2014) supports the idea that acupressure can have a long-lasting effect on improving sleep quality, as shown by a study evaluating its effect on sleep quality in elderly patients with hypertension. The results revealed that acupressure significantly improved sleep quality and that this improvement persisted during the follow-up phase, supporting the long-term effectiveness of acupressure.[18]

The systematic review by (Lee & Frazier, 2011) also supports the idea that acupressure has a lasting impact on sleep quality. The review included several randomized controlled trials (RCTs) demonstrating that acupressure contributes significantly to improving sleep quality in individuals with chronic insomnia. Moreover, many of the studies reviewed showed that the benefits of acupressure persisted even after treatment ended, indicating sustained effects.[19]

Table (11) examines the differences in insomnia levels between the experimental and control groups based on demographic data in the post-assessment. **Age group**: In the 50-60 age group, the experimental group showed greater improvement, with 71.4% experiencing mild

insomnia, compared to 60% in the control group with moderate insomnia. The difference was statistically significant (p=0.000), suggesting a greater improvement in individuals who may have had more severe insomnia in this age group. **Gender**: Among males, the experimental group showed better improvement, with 85.7% experiencing mild insomnia, compared to 60% in the control group with moderate insomnia (p=0.000). **Educational level**: Among those with primary education, 100% of the experimental group experienced mild insomnia, compared to 50% of the control group with moderate insomnia (p=0.000). Among those with secondary education, 71.4% of the experimental group experienced mild insomnia, while all the control group patients with secondary education had moderate insomnia (p=0.000). These results support the idea that the treatment was more effective in men and individuals with lower educational levels, who showed greater improvement in insomnia levels. **Marital status**: Among married individuals, the experimental group was better, with 80% experiencing mild insomnia, compared to 60% in the control group with moderate insomnia (p=0.000). **Occupation**: Among retirees, the experimental group was better, with 80% experiencing mild insomnia, compared to 100% of retirees in the control group who had moderate insomnia (p=0.000). **Explanation**: The differences in insomnia levels between married individuals and retirees suggest that social factors may influence patients' responses to treatment, as retirees in the control group had moderate insomnia, while those in the experimental group showed greater improvement. These results indicate that the treatment was more effective for specific groups of patients based on age, gender, educational level, marital status, and occupation.

The findings suggest that the intervention was particularly effective in individuals with more severe insomnia compared to those with milder insomnia. The study by (Nordio & Romanelli., 2008) supports this idea, demonstrating that acupressure is more effective for individuals with severe insomnia, which aligns with the observations from Table (10). This study found that patients with severe insomnia experienced significant improvements in sleep duration and quality, potentially due to increased melatonin secretion.[20] The study by (Yaghoubi, et al., 2017) supports the effectiveness of acupressure in improving sleep quality, especially for individuals with high levels of insomnia, such as patients' post-major surgery. This study aimed to evaluate the effect of acupressure on sleep quality in CABG patients. The results showed significant improvement in sleep quality in the experimental group compared to the control group, suggesting that acupressure therapy was effective in improving sleep quality after surgery.[21] The results clearly indicate the effectiveness of acupressure in improving insomnia. The data show that the improvement was not only immediate but also sustained long after the intervention ended, demonstrating the lasting effect of this therapeutic technique.

CONCLUSIONS

1. A significant reduction in insomnia levels was observed in the experimental group compared to the control group, with improvements noted in the follow-up assessment.
2. Changes in sleep quality and insomnia levels were statistically significant, indicating the effectiveness of the applied intervention in the experimental group.
3. Statistically significant differences in sleep quality were attributed to demographic factors (such as age, gender, occupation).

Recommendations

- Adopt acupressure as a non-pharmacological technique and incorporate it into the care plan for CABG patients.
- Pay more attention to assessing sleep disturbances in CABG patients to reduce complications and accelerate recovery.
- Conduct further research on larger samples and different types of surgeries to confirm the ability of non-pharmacological interventions to achieve positive outcomes and reduce surgery-related complications.

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