



Effect of Jacobson's Relaxation Technique on Anxiety and Sleep Quality in Burn Patients

Wedad Saber Shafek Abdelkhalek¹, Eman Mahmoud Hafez Mohamed², Ateya Megahed Ibrahim³,
Aml Ahmed Mohammed ELmetwaly^{4*}

1, 4 Medical Surgical Nursing, Medical Surgical Nursing Department, Faculty of Nursing, Mansoura University, Egypt.

2Assistant professor, Medical Surgical Nursing Department, Faculty of Nursing, Aswan University, Egypt

3Assistant professor, Family and Community health Nursing department, Faculty of Nursing, Port Said University, Egypt.

*Corresponding author: Aml Ahmed Mohammed ELmetwaly

Email: amlelmetwaly86@mans.edu.eg

ABSTRACT

Background: Burn victims frequently experience significant levels of anxiety and poor sleep due to their distinctive physical and psychological situations. **Aim:** The present study aimed to evaluate the effectiveness of Jacobson's relaxation technique on anxiety and sleep quality in burn patients. **Design:** A quasi-experimental design was used in the present study. **Settings:** The study was conducted at the Plastic, Reconstructive, and Burn Surgery Center, Mansoura University, Egypt. **Subjects:** The study comprised a purposive sample of 30 adult burn patients. **Tools of data collection:** Data were collected using tool I: A structured interview questionnaire; tool II: The State-Trait Anxiety Inventory (STAI) and tool III: The Pittsburgh Sleep Quality Index (PSQI). **Results:** There was a statistical significance difference among total anxiety levels pre and post-intervention at P value ≤ 0.05 , there was a highly statistically significant difference between total sleep score pre and post-intervention and there was a highly statistically significant effect of anxiety degree on sleep quality among burned patients pre and post applying intervention at p value ≤ 0.001 . **Conclusion:** Jacobson's relaxation technique was very effective in reducing anxiety and improving sleep quality in burn patients post-implementation of the technique. **Recommendation:** Jacobson's Relaxation Technique can be used as a complementary adjunct therapy in conjunction with other medical therapies to lessen the severity of these patients' anxiety levels and sleep disorders.

Keywords: Anxiety, Burn Patients, Jacobson's Relaxation Technique, Sleep Quality

Introduction:

Burns are still a major issue in today's culture, leading to many permanent side effects and irreparable harm to patients and their families

(Harorani, Davodabady, Masmouei, & Barati, 2020). More than 11 million individuals suffer burn injuries each year and need medical care including hospitalization, according to the World

Health Organization (Choi, Lee, Alimoradi, & Lee, 2018).

Hospitalized burn patients endure unpleasant medical treatments throughout the day, such as wound dressing, physiotherapy, and surgery, in addition to the physical and mental distress caused by the burn event itself. Hospitalized burn patients frequently experience anxiety, a typical human reaction to mental or physical trauma (Fardin, Rezaei, & Maslakpak, 2020). Anxiety weakens the immune system, delays wound healing, raises vital signs, induces anorexia, reduces concentration, insomnia, and involvement in self-care activities as well as cooperation with the medical staff (Sadeghi, Azizi, Asgari, & Mohammadi, 2020).

For the best health and wellness, having good sleep quality is crucial (Clement-Carbonell, Portilla-Tamarit, Rubio-Aparicio, & Madrid-Valero, 2021). Normal sleep can be disrupted by burn damage treatment, as well as the physiological and emotional repercussions that follow. In order to recover from a burn injury and maintain physical and mental health, adequate sleep is essential for hormone and emotion regulation (Liang, et al., 2021).

Over 85% of burn victims experience sleep problems while receiving treatment. Lack of sleep can have a variety of side effects on patients, such as poor wound healing, increased heart contractility, elevated blood pressure, and increased hormone release brought on by stress (Chen, et al., 2019). Numerous types of sleep disturbances, such as trouble falling asleep, daytime naps, frequent awakenings from sleep,

increased total sleep time, and decreased sleep efficiency, occur during the initial phase of burn injuries (Wiechman, et al., 2018).

Nonpharmacological therapies are suggested as first-line treatments for insomnia, but they are not frequently used in practice since they are expensive or time-consuming (Chun, et al., 2021).

One of the highest priorities in the management of burn patients is lowering anxiety levels. There are both pharmaceutical and non-pharmacological ways to lessen anxiety. There have been reports of harmful side effects from these medications, despite the fact that pharmacological methods have the greatest impact on lowering pain and anxiety in burn patients (Jafarizadeh, Lotfi, Ajoudani, Kiani, & Alinejad, 2018). Studies have demonstrated that non-pharmacological approaches work better for reducing anxiety in burn patients than pharmaceutical therapy alone (Fardin, Rezaei, & Maslakpak, 2020).

Progressive muscle relaxation (PMR) is an actively engaging relaxation technique developed by Edmund Jacobson in the 1920s (Toussaint, et al., 2021). In PMR, participants actively contract muscles to create tension and progressively release it (Zargarzadeh & Shirazi, 2014). It is easily learned and widely used today as a treatment option for reducing anxiety (Ramasamy, Panneerselvam, Govindharaj, Kumar, & Nayak, 2018).

Extant literature demonstrates the effectiveness of relaxation strategies, such as progressive muscle relaxation, and many other

methods. The aim of the present study was to determine the effect of relaxation on sleep quality and anxiety reduction in burn patients, taking into account the significance of anxiety reduction and sleep quality improvement in burn patients as well as the non-invasive relaxation technique.

Significance of the study:

Burn injuries had incidence rates of 337 per 100,000 outpatients and 32 per 100,000 inpatients, 12.3 disability-adjusted life years, and a death rate of 3.3%, according to the Global Burden of Diseases. Normal sleep can be disrupted by burn damage treatment, as well as the physiological and emotional repercussions that follow. Poor sleep disrupts burn injury recovery, raises the risk of mental illnesses, and lowers the quality of life for burn patients. One week after being discharged, sleep issues were noted in nearly 75 percent of burn patients. At 12 months after discharge, 61.2% of patients reported having sleep disturbances, which is about twice as common as patients without burn injuries (Chun et al., 2021).

Another thing to keep in mind is that psychological conditions like depression or anxiety can contribute to pain in burn injury patients, especially if pain medication is not started before the unpleasant procedures. It is also known that stress can make severe pain worse. However, numerous studies have attempted to describe the burden of mental disease in burn survivors, indicating that mood and anxiety-related problems are common and that up to one-third of patients experience post-traumatic stress disorder (PTSD) (Mason et al., 2017).

Aim of the study:

The aim of the study was to evaluate the effectiveness of Jacobson's relaxation technique on anxiety and sleep quality in burn patients.

Research hypothesis:

H1. Burned patients who receive Jacobson's relaxation technique will experience less anxiety than those who do not receive such intervention.

H2. Burned patients who receive Jacobson's relaxation technique will have an improvement in sleep quality than those who do not receive such intervention.

Method:

Study design:

A quasi-experimental design (pre- and post-intervention) was used in this study.

Setting

This study was performed in inpatient wards at the Plastic, Reconstructive, and Burn Surgery Center, Mansoura University, Egypt followed by outpatient clinics.

Subjects:

A purposive sample of 30 adult patients with burn injuries at the previously above-mentioned setting and fulfilling the following criteria: Aged between 20 to 60 years old, both sexes (male and female), patients have immediate burn injuries (second and third-degree burns or both), willing to participate in the study and conscious who able to communicate.

Sample size:

Based on data from the literature (*Harorani et al., 2020*), considering the level of significance

of 5%, and power of study of 80%, the sample size can be calculated using the following formula: $n = [(Z_{\alpha/2} + Z_{\beta})^2 \times \{2(SD)^2\}] / (\text{mean difference})^2$, where SD stands for standard deviation; $Z_{\alpha/2}$ is 1.96 and Z_{β} is 0.84. Therefore, $n = [(1.96 + 0.84)^2 \times \{2(11.02)^2\}] / (8.0)^2 = 29.7$. Accordingly, the sample size required for the study is 30 patients with burns.

Tools for data collection:

Data were collected using three tools as follows:

Tool I: A Structured Interview Questionnaire:

The researchers constructed it after a review of relevant literature (Alinia-Najjar, Bagheri-Nesami, Shorofi, Mousavinasab, & Saatchi, 2020; Wiechman, et al., 2018) and it included two parts:

Part (1): Demographic characteristics include age, sex, educational level, and occupation.

Part (2): Burn parameters data including burn causes, degree, sites, and extent (total body surface area burned)

Tool II: The State-Trait Anxiety Inventory (STAI)

It was adopted from (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The STAI-Y, which consists of separate self-report measures for assessing two different anxiety concepts: state anxiety and trait anxiety, was employed by the researchers in its Arabic translation. Twenty statements make up the STAI-T scale, which asks respondents to express their overall feelings. The STAI-S scale has 20 statements as well, but

according to the instructions, participants must explain how they are feeling right now.

Scoring system: A four-point scale is used to score each question (not at all, somewhat, moderately so, very much so). This questionnaire yields scores between twenty to eighty, which are classified into four categories: no anxiety (20), mild (21-39), moderate (40-59), and severe anxiety (60-80).

Tool III: The Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI), which was adapted from Buysse et al. (1989), Arabic version, was used to evaluate both sleep problems and sleeping routines and behaviors. 19 items make up the PSQI. The index consists of 15 multiple-choice questions and 4 open-ended questions, such as "How was your sleep quality in the last month?" and "What time did you go to bed in the last month?" This 7-part questionnaire looks into the patient's perception of the quality of their recent sleep (habits and patterns).

The following factors influence sleep was covered by the subscales: 1. Subjective sleep quality; 2. Sleep latency; 3. Sleep length; 4. Habitual sleep efficiency (based on the ratio of efficient sleep duration to the total amount of time spent in bed); and 5. Sleep disruptions (such as waking up at an unscheduled

Scoring system: Each subscale is given a value between 0 and 3, where 0 represents not at all bothered, 1 represents slightly bothered, 2

represents moderately bothered, and 3 represents severely bothered.

A total score of 6 or above indicates poor sleep quality and the total score for sleep quality, which is the sum of the scores on each of the seven subscales, ranges from 0 to 21.

Content Validity:

Three nursing professors of medical surgical nursing at the faculty of nursing, Mansoura University, and two professors connected to the faculty of medicine, Mansoura University, and the aforementioned setting revised the tool I that the researchers had devised for content validity. Using a Likert-type scale with three options—one for disagree, two for unsure, and three for agree modifications are made as necessary. For relevance and clarity, the content validity index for each item ranged from 0.8 to 1.0.

Reliability:

- The validity and reliability of the State-Trait Anxiety Inventory (STAI) have received extensive research support (Cronbach's alpha = 0.896). According to Bahammam (2016), the Arabic version of the STAI-Y demonstrated strong internal consistency reliability (Cronbach's alpha: 0.989).
- According to Morris, Rohay, and Chasens (2018), the PSQI has a reliability range of 93% to 98% (Cronbach's alpha = 0.8 and test-retest alpha = 0.87). Where, according to Al Maqbali et al. (2020), the Arabic PSQI's Cronbach's alpha coefficient was 0.77, indicating satisfactory reliability.

A pilot study

A pilot study was carried out on 10 % (3 patients) in the previously mentioned setting, to evaluate clarity, ambiguity, applicability, objectivity, relevance, and feasibility. Modifications were made accordingly. Subjects who were shared in the pilot study were excluded from the study sample.

Fieldwork

From early March 2023 to the beginning of May 2023, data were collected throughout a three-month period. Three days a week, from 9:00 AM to 2:00 PM, researchers were present in the settings stated above. The following phases of data gathering were used.

The assessment phase:

The researchers conveyed the study's aim and tool components. Moreover, it was a guide for developing tools for data collection and learning materials for Jacobson's relaxation technique (Brochure). Jacobson's relaxation technique brochure was developed by researchers based on the related literature, textbooks, and available published guidelines. The brochure is designed in simple, clear, and obvious Arabic language that is supported with figures for more clarification. The time taken by each patient to complete the questionnaire is estimated to range from 20 to 30 minutes.

The Implementation phase:

- ✓ In the beginning, patients who met inclusion criteria were individually interviewed pre-intervention. The researchers managed to interview from 1 to 2 patients per day where

patients were asked about demographic and burn parameters by using tool I. The level of anxiety was measured for studied patients by using tool II. Quality and patterns of sleep were assessed by using tool III. The time estimated for each patient ranged from 20-30 minutes.

- ✓ Then, the study sample is trained on Jacobson's relaxation technique (PMR and deep breathing), in patients' rooms at the Plastic, Reconstructive, and Burn Surgery Center using several methods, including observing the researchers while performing the technique and then repeating the technique after them, using smartphones that include simple illustrated videos on how to perform the technique. After that, the study sample was provided with an educational brochure that includes how to perform the technique as follows:

- Providing a calm environment free from any distractions, ensuring that the body is comfortable on the bed, and providing instructions on how to contract and relax specific muscle groups in turn, starting with the upper body and working down to the lower body, or vice versa.
- Patients were instructed to tighten their muscles for a gradual count of five seconds, then quickly and totally relax them for ten seconds, letting all of the tension and pain leave the muscles and causing a general feeling of relaxation. The patients were also inhaling deeply through their noses and exhaling through their mouths. The preferred position for relaxation was supine.

- ✓ Then Patients were then taught how to relax using Jacobson's relaxation technique, and after making sure they understood how to do it and how to apply the technique correctly, the researcher answered patients' questions about the technique. Every training session was carried out under the researchers' observation for three sequential days, lasting 20 to 30 minutes each day.
- ✓ Finally, tool II and tool III are used to degree the level of anxiety and sleep quality immediately post applying Jacobson's Relaxation Technique.

Evaluation phase:

This phase focused on evaluating the effect of Jacobson's Relaxation Technique on anxiety and sleep quality in burn patients. The outcomes were assessed by comparing the results before and after the intervention using the same assessment tools.

Ethical consideration and human rights

- Ethical approval was obtained from the Research Scientific Ethical Committee of the Faculty of Nursing, Mansoura University (Ref. No. P. 0435). Verbal consent was also obtained from each participating patient prior to his/her inclusion into the study after clarification of the nature and aims of the study.
- The researchers emphasized that participation is absolutely voluntary, and anonymity, privacy, rights, and safety of patients and nurses were absolutely assured from the beginning of the study. Confidentiality of the collected data will be maintained. Subjects were informed that they have the right to

withdraw from the study at any time without effect on their treatment and care.

Statistical analysis

The data were collected, coded, and entered into a personal computer. The data were analyzed with the protocol using the statistical package for social science (SPSS). Qualitative data were presented as frequencies (n) and percentages (%). Quantitative data were described using mean and standard deviation. Chi-square test, Student T-test, and ANOVA test. The significance level was set as follows: Non-significant (NS) when $P > 0.05$; Significant (S) when $P < 0.05$ and Highly Significant (HS) when $P < 0.001$.

Results

Figure (1) shows that there is a statistical significance difference among total anxiety levels pre and post-intervention at $P \text{ value} \leq 0.05$ with Mean \pm SD 58.6 ± 6.1 and 54.3 ± 6.4 respectively. This is clearly evident in, the participants with no anxiety pre-intervention are 0.0% while post-intervention the participants with no anxiety increased to 10.0% in addition to patients with severe anxiety are 66.7% pre-intervention which decrease after applying intervention to reach 26.7%.

Table (1) illustrates that there is a high statistical significance difference between total sleep score pre and post-intervention at $p\text{-value} \leq 0.001$ with Mean \pm SD 14.7 ± 4.9 and 10.0 ± 5.0 respectively.

Figure (2) shows a statistical significance difference between sleep quality pre and post-applying intervention at X^2 5.455 and P value 0.020, which appeared strongly through 93.3% of the participants have poor sleep quality pre-intervention while post-applying intervention this percentage decreased to reach 70.0%.

Table (2) elucidates that there is no statistically significant effect of age, educational level, and cause of burn on anxiety degree between burned patients pre and post-applying the intervention at $P \text{ value} > 0.05$. While there is a statistically significant effect of gender, marital status, degree of burn, and extension of burn on anxiety degree between burned participants pre and post-applying intervention at $P \text{ value} \leq 0.0$

Table (3) clarifies that there is no statistically significant effect of age, gender, and marital status on sleep quality between burned patients pre and post-applying intervention at $P \text{ value} > 0.05$. on the other hand, there is no statistically significant effect of educational level, cause of burn, degree of burn, and extension of burn on sleep quality pre-intervention. However, after applying the intervention, there is a statistically significant effect of these factors on sleep quality, with a $P \text{ value} \leq 0.05$.

Table (4) illustrates that there is a high statistical significance effect of anxiety degree on sleep quality among burned patients pre and post-application of the intervention.

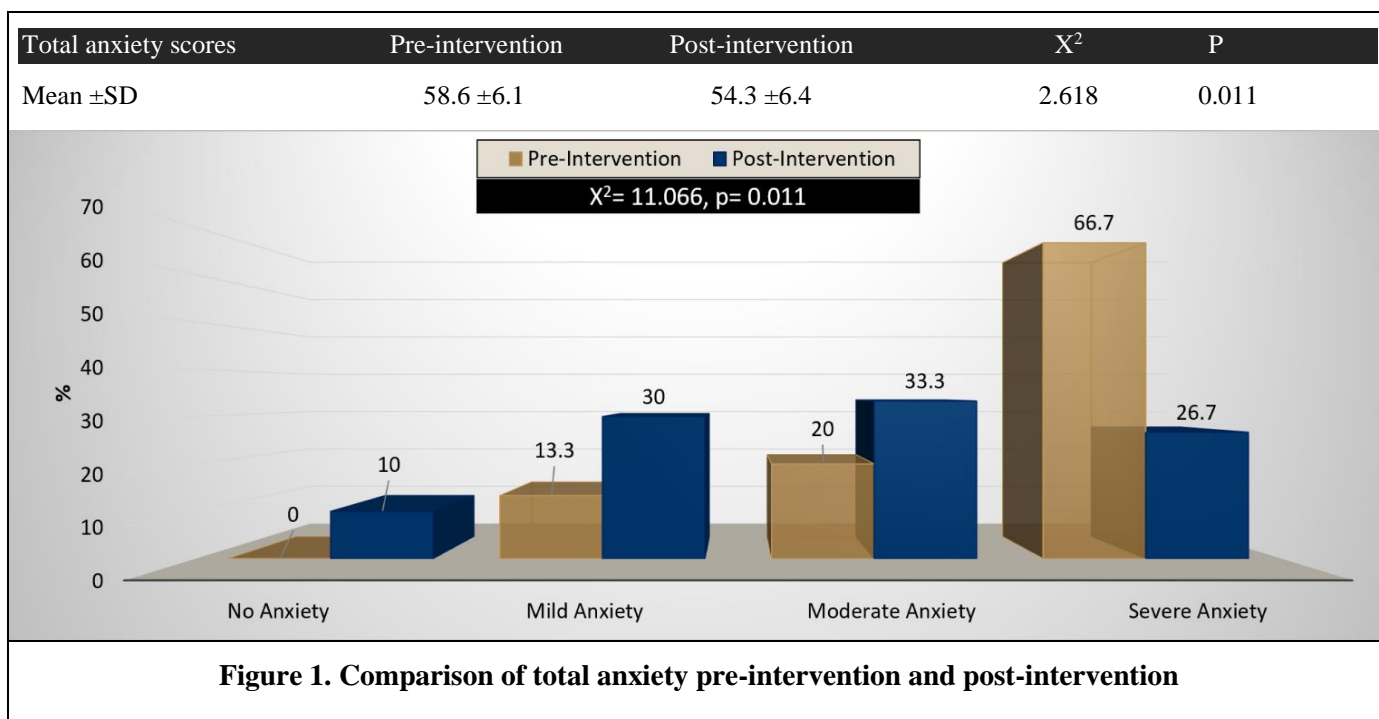


Table 1. Comparison of PSQI components between pre-and post-intervention

	Pre-intervention	Post-intervention	Student T-test	
	Mean \pm SD	Mean \pm SD	T	P
Subjective Sleep Quality	2.3 \pm 0.7	1.6 \pm 0.8	3.606	<0.001
Sleep Latency	2.3 \pm 0.9	1.5 \pm 0.7	3.843	<0.001
Sleep Duration	2.1 \pm 0.9	1.5 \pm 0.7	2.882	0.005
Habitual Sleep Efficiency	2.2 \pm 0.8	1.4 \pm 0.6	4.382	<0.001
Sleep Disturbances	1.8 \pm 0.8	1.3 \pm 0.6	2.738	0.008
Use Of Sleep-Promoting Medications	1.9 \pm 0.9	1.2 \pm 0.5	3.724	<0.001
Daytime Dysfunction	2.2 \pm 0.8	1.4 \pm 0.7	4.121	<0.001
Total PSQI Score	14.7 \pm4.9	10.0 \pm5.0	3.667	<0.001**

Student T- test

* statistically significant at $p \leq 0.05$.

** Highly statistically significant at $p \leq 0.001$.

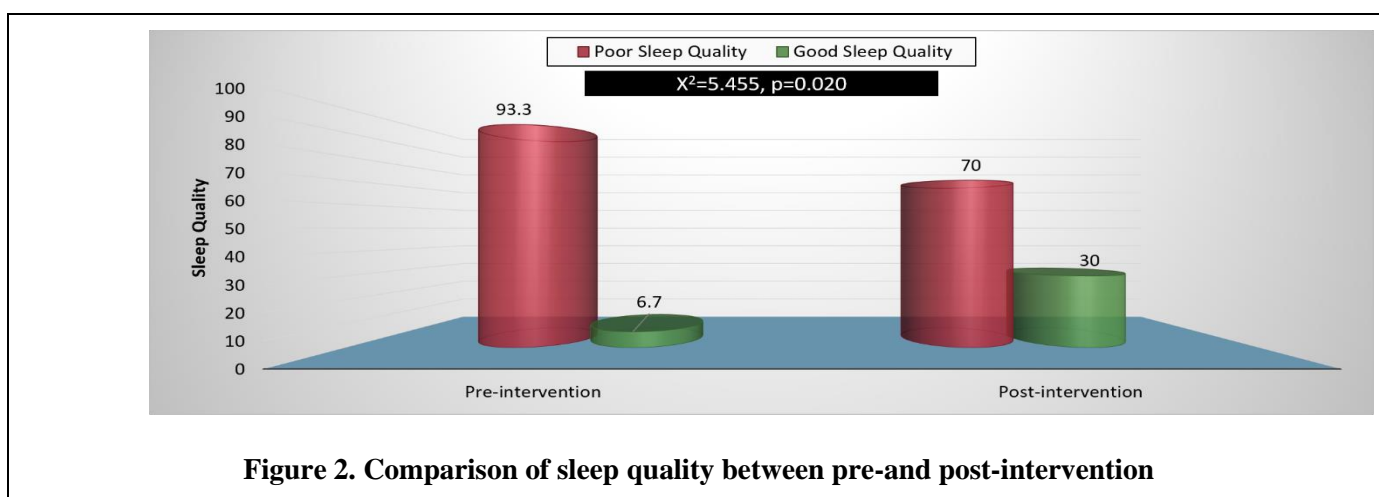


Table 2. Association between the sociodemographic characteristics and anxiety of the patient's pre- and post-intervention

	Mild Anxiety (n=4)		Moderate Anxiety (n=6)		Severe Anxiety (n=20)		ANOVA		No Anxiety (n=3)		Mild Anxiety (n=9)		Moderate Anxiety (n=10)		Severe Anxiety (n=8)		ANOVA	
	n	%	n	%	n	%	F	P	n	n	%	n	n	%	n	%	F	P
Age																		
21 < 30	3	75.0	0	0.0	5	25.0	7.789	0.253	2	66.7	3	33.3	1	10.0	2	25.0	7.701	0.565
30 < 40	1	25.0	3	50.0	6	30.0			0	0.0	4	44.4	3	30.0	3	37.5		
40 < 50	0	0.0	2	33.3	5	25.0			0	0.0	1	11.1	4	40.0	2	25.0		
50 – 60	0	0.0	1	16.7	4	20.0			1	33.3	1	11.1	2	20.0	1	12.5		
Gender																		
Male	3	75.0	6	100.0	6	30.0	10.200	0.006*	2	66.7	5	55.6	8	80.0	0	0.0	12.044	0.007*
Female	1	25.0	0	0.0	14	70.0			1	33.3	4	44.4	2	20.0	8	100.0		
Marital																		
Single	0	0.0	0	0.0	9	45.0	6.429	0.040*	3	100.0	0	0.0	0	0.0	6	75.0	22.857	<0.001*
Married	4	100.0	6	100.0	11	55.0			0	0.0	9	100.0	10	100.0	2	25.0		
Educational Level																		
Illiterate	0	0.0	2	33.3	10	50.0	7.722	0.102	0	0.0	3	33.3	4	40.0	5	62.5	6.025	0.420
Basic	1	25.0	1	16.7	7	35.0			1	33.3	4	44.4	2	20.0	2	25.0		
Secondary	3	75.0	3	50.0	3	15.0			2	66.7	2	22.2	4	40.0	1	12.5		
Cause of burns																		
Thermal	3	75.0	5	83.3	18	90.0	0.721	0.697	3	100.0	8	88.9	8	80.0	7	87.5	0.889	0.082
Chemical	1	25.0	1	16.7	2	10.0			0	0.0	1	11.1	2	20.0	1	12.5		
Degree of burn																		
Second degree	3	75.0	1	16.7	1	5.0	13.950	0.030*	1	33.3	2	22.2	2	20.0	0	0.0	13.333	0.038*
Third degree	0	0.0	2	33.3	3	15.0			1	33.3	4	44.4	0	0.0	0	0.0		
Second and third degree	1	25.0	3	50.0	16	80.0			1	33.3	3	33.3	8	80.0	8	100.0		
Extent (TBSA)																		
9 – 20%	3	75.0	6	100.0	3	15.0	16.313	0.002*	3	100.0	4	44.4	5	50.0	0	0.0	14.028	0.029*
21 – 30%	1	25.0	0	0.0	15	75.0			0	0.0	5	55.6	5	50.0	6	75.0		
31 – 40%	0	0.0	0	0.0	2	10.0			0	0.0	0	0.0	0	0.0	2	25.0		

Anova test

* statistically significant at $p \leq 0.05$.** Highly statistically significant at $p \leq 0.001$.

Table 3. Association between the socio-demographic characteristics and sleep quality pre-and post-intervention

	Good (n=2)		Poor (n=28)		ANOVA		Good (n=9)		Poor (n=21)		ANOVA	
	N	%	n	%	F	P	n	%	N	%	F	P
Age												
21 < 30	0	0.0	8	28.6	3.367	0.338	1	11.1	7	33.3	7.602	0.055
30 < 40	0	0.0	10	35.7			6	66.7	4	19.0		
40 < 50	1	50.0	6	21.4			2	22.2	5	23.8		
50 – 60	1	50.0	4	14.3			0	0.0	5	23.8		
Gender												
Male	0	50.0	15	50.0	2.143	0.143	3	33.3	12	57.1	1.429	0.232
Female	2	50.0	13	50.0			6	66.7	9	42.9		
Marital												
Single	2	100.0	7	25.0	5.000	0.025	1	11.1	8	38.1	2.184	0.139
Married	0	0.0	21	75.0			8	88.9	13	61.9		
Educational Level												
Illiterate	0	0.0	12	42.9	5.000	0.082	6	66.7	6	28.6	6.190	0.045*
Basic	0	0.0	9	32.1			0	0.0	9	42.9		
Secondary	2	100.0	7	25.0			3	33.3	6	28.6		
Cause of burn												
Thermal	2	100.0	24	85.7	0.330	0.566	8	88.9	18	85.7	0.055	0.815
Chemical	0	0.0	4	14.3			1	11.1	3	14.3		
Degree of burn												
Second degree	0	0.0	5	17.9	1.071	0.585	5	55.6	0	0.0	14.048	<0.001*
Third degree	0	0.0	5	17.9			1	11.1	4	19.0		
Second and third degree	2	100.0	18	64.3			3	33.3	17	81.0		
Extent (TBSA)												
9 – 20%	2	100.0	10	35.7	3.214	0.200	7	77.8	5	23.8	7.778	0.020*
21 – 30%	0	0.0	16	57.1			2	22.2	14	66.7		
31 – 40%	0	0.0	2	7.1			0	0.0	2	9.5		

Anova test * statistically significant at $p \leq 0.05$.** Highly statistically significant at $p \leq 0.001$.**Table 4. Association between the sleep quality and anxiety pre-and pot-intervention**

	Good (n=2)		Poor (n=28)		Chi-Square		Good (n=9)		Poor (n=21)		Chi-Square	
	n	%	n	%	X ²	P	n	%	N	%	X ²	P
No anxiety	1	50.0	0	0.0	19.286	<0.001*	3	33.3	0	0.0	20.476	<0.001*
Mild anxiety	1	50.0	2	7.1			6	66.7	3	14.3		
Moderate anxiety	0	0.0	6	21.4			0	0.0	10	47.6		
Severe anxiety	0	0.0	20	71.4			0	0.0	8	38.1		

Chi-Square test

** Highly statistically significant at $p \leq 0.001$.

Discussion

Burn-related pain is known to be accompanied by worry during physical rehabilitation therapy and surgical procedures, and studies have shown that procedural pain-related anxiety grows as therapy proceeds. In burn victims, post-traumatic stress disorder is known to be correlated with pain, anxiety, degradation of the quality of life, and distress, whereas patients with greater levels of anxiety report more acute background discomfort during the subjective assessment. Post-burn depression has been linked to predisposing elements like grief and mourning, pain, social isolation while in the hospital, and pre-burn melancholy (Markiewicz-Gospodarek, et al., 2022).

Thus, the current study was conducted on the effectiveness of Jacobson's Relaxation Technique on Anxiety and Sleep Quality in Burn Patients.

Researchers conducted a chi-square test to evaluate the effectiveness of Jacobson's Progressive Muscle Relaxation Technique on anxiety levels, resulting in a statistically significant difference between the overall anxiety levels pre and post-intervention, which is clearly evident given that all participants reported having no anxiety prior to the intervention. Whereas after it, the participants with no anxiety increased to the tenth percentile, decreasing the percentile to a moderate level. Additionally, patients who had severe anxiety represented two-thirds of the population prior to the intervention, but their percentage decreased to the quarter percentile. This result proves the fact Progressive Muscle

Relaxation showed some success in reducing burn patients' anxiety levels.

In a study conducted by Parás-Bravo and his colleagues to determine whether Jacobson's relaxation technique could help cancer patients take fewer psychotropic and analgesic medications, it was discovered that nearly all of the patients who used the Progressive Muscle Relaxation technique reported an improvement in anxiety level. After one week, this resulted in a maximum reduction in the use of anxiolytics in around a quarter of patients, and a maximum of fourteen percent of patients did not require anxiolytic medication (Parás-Bravo, et al., 2018).

In the same direction, results of a study by Akbari, Ahmadi, Jalili, & Khazaei, (2020), showed that in the intervention group, the scores of anxiety and stress after using Jacobson and Benson relaxation decreased significantly, while in the control group, no significant decrease was observed. This could be because relaxation techniques have been demonstrated to lower cortisol levels in patients, which then results in a decline in physical and subjective stress experiences and a reduction in anxiety (Dawson, Hamson-Utley, Hansen, & Olpin, 2014).

The results of the concurrent study showed that there was a highly statistically significant difference between the total sleep score of burn patients pre and post implementing Progressive Muscle Relaxation technique. The majority of participants had poor sleep quality pre-

intervention, but after it was implemented, this percentage decreased to more than two-thirds.

The results lend credence to the idea that burn injuries could disrupt sleep for a variety of reasons, including physiological responses to trauma and treatment-related side effects (such as being hospitalized, in pain, itching, anxiety, or taking medications). However, as burn healing progresses, sleep quality generally gets better, especially when relaxation techniques like Jacobson's Relaxation Technique are used to enhance burn patients' sleep.

Hutchinson, Karmali, Abi-Jaoude, Edwards, and Homsy's study (2022), which found that burn patients' sleep was negatively impacted and that Jacobson's Relaxation Technique had a positive impact on burn patients' sleep quality after implementation, supported this finding. The results of the systematic review, according to Lerman, et al. (2022), also showed that a variety of sleep disorders are widespread in burn survivors, extending years after the injury, and are linked to pain, itch, emotional discomfort, and a decline in quality of life. Results from a meta-analysis of four research showed that various therapies could improve the quality of sleep.

Also, Harorani, Davodabady, Masmouei, & Barati (2020) concluded that the improvement in sleep quality in the experimental group compared to the control group was high. In the same vein, Mokhtari, Ajorpaz, Abdi, & Golitaleb (2023) revealed that the sleep quality scores of the intervention group were high

compared to the control group after intervention and there was a highly statistically significant difference. Furthermore, the intervention improved sleep quality in burn patients, suggesting this approach is a useful complementary method along with other therapeutic measures.

These findings supported that, Jacobson's method has been the most studied and used technique in clinical management of insomnia disorder (Riemann, et al., 2017). Interestingly, in the late 1960s of the twentieth century, Jacobson amusingly responded that insomnia sufferers are a group of chronic complainers who is best to keep away from clinical practice when he was asked about the suitability of utilizing his relaxation training in the context of insomnia (Hauri, 1991).

Results of the present study adduced that there was a statistically significant effect of gender, marital status, degree of burn, and extension of burn on anxiety degree between burned participants pre and post-applying intervention. These results disagreed with Mokhtari, Ajorpaz, Abdi, & Golitaleb (2023) revealed that there were no significant differences between the two groups regarding the mean age, sex distribution, marital status, employment status, education level, and history of hospitalization. This result was matched with Jain, Khadilkar & De Sousa (2017) reported that high rates of anxiety and depression are associated with burn injuries and related to burn depth.

Moreover, the findings elaborated that there is no statistical significance effect of educational

level, cause of burn, degree of burn, and extension of burn on sleep quality pre-intervention while there was a statistical significance effect of them on sleep quality after applying intervention. This result agreed with Hutchinson, Karmali, Abi-Jaoude, Edwards, & Homsy (2022) stated that education, degree, and depth of burn had a great association with the sleep quality of burnt patients, where sleep quality decreased with deep and major burn pain area.

Finally, findings of the current study illustrated that there was a highly statistically significant effect of anxiety degree on sleep quality among burned patients pre and post-applying intervention. This result was strongly supported by Harorani, Davodabady, Masmouei, & Barati (2020) indicated a statistically significant decrease in anxiety and improvement in sleep quality in the experimental group compared to the control group. Furthermore, Karadag, Samancioglu, Ozden, & Bakir (2017) concluded that anxiety and sleep quality in burnt patients were highly associated.

Although the link between sleep and anxiety is not entirely understood, sleep disruption may make anxiety more likely to occur. A person is 17 times more likely to experience clinical anxiety if they have a sleep condition like insomnia. Having anxiety might also make it difficult to sleep. Increased arousal or alertness is a mark of anxiety, whether it is pathological or not, and it affects the sleep-wake cycle (National Sleep Foundation, 2020).

This may also be explained by the fact that people who are anxious tend to ruminate and overthink things, which keeps them up at night. Hyperarousal is a crucial factor in insomnia that prevents the body from falling asleep. According to Kalmbach, et al. (2018), this is a result of neurobiological and psychological hyperactivity.

Therefore, it is significant to notice that relaxation training is now regarded as a regular method of "effective and recommended therapy" after previously being recommended as a strategy for treating sleeping disorders.

Conclusion

- Burn treatment as well as its effect on patients increases their level of anxiety and sleep disturbance pre-application of Jacobson's Relaxation Technique. While post implementation of Jacobson's Relaxation Technique, the anxiety level was reduced and sleep quality improved which proved the success and effectiveness of the technique through pre and post-Jacobson's Relaxation Technique intervention.
- Besides there was a highly statistically significant effect of anxiety degree on sleep quality among burned patients pre and post-applying Jacobson's Relaxation Technique intervention.

Recommendation

The findings of our study showed that Jacobson's Relaxation Technique can be used as a complementary adjunct therapy in conjunction with other medical therapies to lessen the severity of these patients' anxiety levels and sleep disorders

as it is a relatively cost-effective therapy in treatment strategies.

Teaching this approach to nurses, practicing it on burn patients, and comparing it to other complementary therapies can help burn patients recover quickly and experience higher levels of patient satisfaction, especially with regard to their anxiety and sleep.

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