Effect of Benson's Relaxation Therapy on Pain and Sleep Quality among PatientsUndergoing Thoracic Surgery

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Abstract

Background: Most patients post-thoracic surgery complains of pain and sleep disturbances. Benson's relaxation therapy is one of the non-pharmacological pain management techniques that helps patients recover after thoracic surgery by lessening their discomfort and analgesic side effect**. Aim:** Evaluate the effect of Benson's relaxation therapy on pain and sleep quality among patients undergoing thoracic surgery. **Design:** A quasi-experimental design was utilized to conduct this study. **Setting:** The study was conducted at cardiothoracic surgery department in Badr University Hospital affiliated to Helwan University**. Subjects:** A purposive sample of 100 post-thoracic surgery patients was recruited for this study. **Tools:** Three tools were used for data collection I. Structured interview questionnaire included personal and health relevant data. II. Short Form McGill Pain Questionnaire (SFMPQ). III. Groningen Sleep Quality Scale (GSQS). **Results:** The studied subject with mean age was 57.1 years and 55.4 years for study and control groups respectively. 78%, 66% and 74%, 66 respectively of both studied subjects were married and lived in rural areas, concerning income; around 56% of the participants hadn't enough income. While 84%and 86% of both groups respectively was having surgical history. There was an improvement in pain scores among the study group subjects at immediately postoperative day. Also there was a highly statistical significant difference existed between study and control groups regarding pain scores at 3rd postoperative day at $p< 0.001$. Furthermore, there was a highly statistically significant relation between study and control groups regarding sleep quality at post-intervention period at $p< 0.001$ **.Conclusion:** Patients undergoing thoracic surgery had a positive improvement after applying Benson's relaxation technique, which reduced postoperative pain and enhanced sleep quality. **Recommendation:** Benson's relaxation therapy (BRT) is a simple, cost-effective, and useful tool that nurses should focus on more when caring for post-operative patients.

Keywords: Benson Relaxation Therapy, Pain, Sleep Quality, Thoracic Surgery Patients.

Introduction

Thoracic surgery results in extreme postoperative pain, which increases the risk of respiratory problems like hypoxia, atelectasis, and infections of the lungs. Furthermore, improper management of pain can result in post-thoracic surgery pain syndrome, which can last for many years: For these reasons, effective pain management is crucial following surgery. An urgent national healthcare concern is the provision of efficient pain management, because this diminishes the suffering of the patient and lowers the possibility of physical and psychological side effects; additionally, pain management could improve patient happiness and clinical outcomes **(Desimir et al., 2021).**

Benson's relaxation is an illustration of a prosperity-emitting approach for managing sleep difficulties and total body relaxation. Furthermore, urge charge lessens general unease, agitation of the mood, bodily discomfort, autonomic nervous system activity, and at a minimum, this might influence the quality of sleep. Also, relaxation therapy reduces the time needed to fall asleep, the latency of lodge storms, and the frequency of waking up **(Sahar and Taghreed, 2017).** The primary goal of the thoracic surgery nursing specialty is to support and educate patients having thoracic surgery in order to achieve the desired external, psychological, social, and spiritual well-being results **(Fatemeh et al., 2019).**

Relaxation therapies, complementary therapies, and curative therapeutics are all significant components of nursing interposition. Relaxation methods include musical exercises such as progressive relaxation, self-hypnosis, biofeedback, and guided emotional imagery. In order to control discomfort, restlessness, mood swings, self-expectations, and depression, Benson's relaxation plays a crucial natural and psychological role. Additionally lowers force. Benson's relaxation has a crucial physiological and psychological role in controlling tension, restlessness, mood swings, expectations of oneself, depression, and increases force, In order to have a significant impact, this technique needs to be used in a positive mindset, a peaceful, relaxed frame of mind, and a recreated the environment **(Barabady et al., 2020).**

The feeling of pain has several facets. Each person's experience will be different. Another definition of pain is "an unpleasant feeling that we primarily identify with tissue damage". Anytime the individual who is suffering pain claims something exists, that is real. Pain is common following surgery; it might hinder the ability of the body to fully recover. After a thoracic surgery, patients reported extremely high levels of pain throughout the first 24 hours, and the majority of patients continue to endure acute pain even after taking analgesics **(Devmurari and Nagrale , 2018).**

The reduction in total sleep time over the course of a 24-hour period compared to one's normal baseline is referred to as sleep deprivation. In severely ill individuals, including those undergoing surgery, it may have potentially harmful multi-systemic effects. Therefore, both preoperative and postoperative care for surgical patients must consider the need of getting enough sleep. Poor sleep stress, when combined with surgical stress, can result in increased tissue breakdown and catabolism as well as decreased anabolism. This will have an impact on postoperative recovery **(McEwen and Karatsoreos, 2015).**

Significance of the study

More than 80% of patients in Egypt who undergo surgery report moderate to severe postoperative pain. The physiological reaction to pain is almost universally regarded as negative, and unattenuated pain is thought to be critically unstable hemodynamically, affect immune system function, raise blood sugar, and increase excretion of catecholamine's, cortisol, and anti-diuretic hormones. So a thoracic nurse's role is to help and educate the patients going through surgery or dealing with thoracic diseases. The care given does not just concentrate on the management therapies the patient got while in the hospital; also continues throughout the patient's whole treatment course, including lifestyle adjustment **(Barabady et al., 2020).**

Pain, tension, and sleeping issues are the most typical post-operative complaints. For patients who have undergone surgery, acute postoperative pain management still shows pain scores more than three in up to 30% of cases **(Aktas and Yilmaz, 2017).** So the aim of the current study is to evaluate the effect of Benson's relaxation technique on pain and sleep quality among patients undergoing thoracic surgery.

Aim of the study

This study aimed to evaluate the effect of Benson's relaxation therapy on pain and sleep quality among patients undergoing thoracic surgery.

Research hypothesis:

The current study hypothesized that:

Benson's relaxation therapy will be effective on decreasing pain and improving sleep quality among patients undergoing thoracic surgery**.**

Operational definition:

Benson's relaxation therapy refers to a form of relaxation technique which focuses on breathing.

Pain is the self-report of unpleasant sensation which arises due to tissue damage after the thoracic surgery as measured through numerical pain scale.

Patients undergoing thoracic surgery refers to the Patients' with all types of thoracic surgery.

Subjects and Methods

Research design: A quasi-experimental design was utilized to conduct this study. A quasi -experimental design is defined as an empirical interventional study used to estimate the causal impact of an intervention on its target population without random assignment **(Silverman, 2016).**

Setting: The study was conducted at the cardiothoracic surgery department in Badr University Hospital affiliated to Helwan University**.**The building was located at the 1st floor and consists of three rooms for males and females; 1st room included 15 beds, 2nd room included 17 beds and 3rd room included 2 beds for isolation cases.

Subjects: A purposive sample of 100 patients undergoing thoracic surgery was involved in this study. Patients were selected who met the following criteria:

- Adult patients from both sexes.
- Patients with all types of thoracic surgery.
- Patients willing to take a part in the study.

Exclusion criteria

- The unwillingness patient to participate inthe study.
- Patients have physical disability.
- Patients with regular tranquillizer or sedative drugs.
- Patients had a previous history of psychiatric disorders.

Sample size was then randomly assigned to two equal groups (study and control group) each group comprised of (50) patient.

The first group (study group) who received the instructions about Benson relaxation therapy and began to implement the technique post operation by two hours after regaining their consciousness then by three days later.

The second group (control group) who exposed only to regular routine medical and nursing care and didn't participate in any physical therapy program during the time of the study.

The sample size is calculated by adjusting the power of the test to 80% and the confidence interval to 95% with margin of error accepted adjusted to 5% and a known total population of 710 patients using the following equation:

$X = Z(c/100)2r(100-r), N = NX/((N-1)\ E2+x)$

$E = Sqrt\ [(N-n)\ x/n(N-1)]$.

Where N is the population size, r is the fraction of responses that you are interested in, and Z(c/100) is the critical value for the confidence level (**Chau et al., 2017**).

Tools of data collection:

Data collection was compiled using three tools:

Tool I: Structured interviewing questionnaire*:*

It was developed by the researcher in an Arabic language based on reviewing relevant and recent literatures **(Myatt, 2006 & Melzack and Katz, 2001; Knufinke et al., 2018)** .It included the following two parts:

Part 1: Socio- demographic characteristics as; sex,age, marital status, educational level, income, residence and job status.

Part 2: Medial data included: present complaints, previous hospitalization, previous surgeries, and type of the previous surgery.

Tool II: The Short Form McGill Pain Questionnaire (SF- MPQ):

It was developed by **Melzack (1987)** from **Jensen and Karoly (2014).** It utilized by the researchers to assess patient's pain. It provides valuable information on the sensory, affective, and evaluative dimensions of pain experience. It consisted of 15 items; pain descriptors were brought together and categorized in three subscales of pain experience:

- Items from l to11 represent the sensory subscale of painexperience
- Items from 12 to15 represent the affective subscale of pain experience.

Scoring system:

The fifteen items are scored on a four-point pain intensity scale: zero indicates no pain, one indicates mild pain, two indicates moderate pain, and three indicates severe pain. The overall pain scores (comprising fifteen items) are produced by adding the

intensity values for the subsequent descriptors **(Melzack, 1987)**.

To obtain a total score of (forty five), all items were summed, and the total score was categorized as follow **(Jensen and Karoly, 2014)**: Mild pain (1 < 15), Moderate pain (15< 30) and Severe pain (30- 45).

Tool III: Groningen Sleep Quality Scale (GSQS):

It was developed by (**Mulder-Hajonides Van Der Meulen et al., 1981& Knufinkem et al., 2018**), to assess client's previous night's sleep quality. It composed of fifteen statements about the previous night's sleep, answered with true or false. The sum of this scale expressed a generalized score of the previous night's sleep quality. In the GSQS, a higher score indicated more sleep disruption.

Scoring system: The answer to the first question is not included in the total score. For questions 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, and 15, one mark was awarded for each "True" response, and one mark was given if the answer was "False" for questions (8, 10, and 12). Groningen Sleep Quality Scale total scores were summed that ranged from zero to fourteen. Maximum higher score of 14 points indicated poor sleep the night before. The quality of sleep was ranged as follow: Good sleep: zero – five, fair sleep: six – eight and poor sleep: nine – fourteen.

Operational design

The operational design includes preparatory phase, content validity and reliability, pilot study and field work.

A) Preparatory phase:

It was included reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, and periodicals to develop tools for data collection.

B) Tool validity and reliability:

Tool validity was conducted to determine whether the tool covered the aim of the study or not. It was tested through panel of seven experts; three professors, three assistant professors and one lecturer of medical surgical nursing from Ain Shams and Helwan University who review the tool to ensure its validity for comprehensiveness, accuracy, clarity and relevance.

Reliability of the developed tools was tested assessed in a pilot study by measuring their internal Consistency using Cronbach's alpha method. This turned to be (α =0.85) to study tool.

C) Pilot study:

A pilot study was conducted of 10 % of the study subjects include 5 post thoracic patients in study and 5 post thoracic patients in control group to clarify the feasibility, applicability, clarity or objectivity of the data collection tools and then the necessary modifications were carried out accordingly.

D) Field work:

The study was conducted through three consecutive phases: interviewing & assessmentphase, implementation phase and evaluation phase which takes three months for data collection from the start of May 2023 till the end of July 2023.

The interviewing and assessment phase:

In this phase, the researchers clarified the purpose of the study, the components of the tools, and the steps of the Benson Relaxation Technique (BRT). The time required to complete the questionnaire ranged from 20-35 minutes for every patient.

The implementation phase:

The researchers performed three individual interviews with each patient during the study's duration with each of the 50 patients who were randomly allocated to each of the two equal arms in this phase.

The first interview was conducted by the researchers with each participant in both groups to gather baseline socio-demographic and health-related data. The interview is frequently conducted in the patient's hospital room. Using tools I, II, and III, it took between 20 to 35 minutes. The patients receive instruction on the Benson's` relaxation method by the researchers through videos, brochures,

demonstrations, and re-demonstrations. And instruct the subjects of the study group Benson's relaxation technique steps; 1. Be in a comfortable sitting position, 2. Close his eyes, 3. let all of his muscles relax, starting at his feet and working up to his face, then relaxing all of his body parts, (4) Take a breath via his nose, (5) Pay attention to the sound of his breathing, (6) For 20 minutes, silently repeat the word "one" to himself while exhaling. There was a 20 minute repeat of music. The eyes were closed for a while after the music stopped, and then eventually opened. The BRT instructions will be used after two hours postoperatively when restoring consciousness for 10 minutes every two or four hours throughout the day. Then the researchers carried revision and reinforcement according to participant's needs. The researchers handled questions and corrected improper technique performance.

The second and third interviews were carried out by the researchers for each participant of both groups at the immediately postoperative day (two hours) and a third day postoperative using tool IIand tool III.

The evaluation phase: This phase was emphasized on recognizing the intervention`s effect of Benson`s relaxation technique on patient's level of pain and sleep quality, and that through making a comparison between the two groups at immediately and day three postoperative.

Administrative and Ethical considerations:

An official approval was obtained from administrative authorities to hold out the study subsequent to explanation the aim of the study.

Ethical approval to conduct the study was obtained from the Ethics Committee of the Faculty of Nursing, at Helwan University (No.34).Also the necessary approvals were obtained from the director and nursing director of Badr University Hospital affiliated to Helwan University and the head nurses/supervisors of cardiothoracic surgery department.

Written consent was obtained from patients and informed that their participation in the study is optional and that they may withdraw at any time during the study when they decide.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 16, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison between two groups and more was done using Chi-square test (χ^2). For comparison between means of two related groups (pre and post test data) of parametric data, paired t-test was used. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p<0.05$ for interpretation ofresults of tests of significance.

Results

Table 1 Reveals that the mean age was 57.1 years and 55.4 years for study and control groups respectively. Nearly 78%& 66% and 74% & 66 respectively of both studied subjects were married and lived in rural areas. Concerning income, around 56% of the participants hadn't enough income. No statistically significant differences were found between both groups in relation to their socio-demographic characteristics.

Fig. 1 shows that, regarding education, around of 46 % and 42% of study and control subjects had primary education respectively.

Fig. 2 shows that, regarding occupation, about 72 % and 80% of both groups respectively were not working.

Fig. 3 represents that 84% and 86% of both groups respectively were having surgical history.

Table 2 illustrates that, the frequency distribution of patients in both groups according to medical data. As regards to the present complaints, the highest percentages were complaining from pain along the ribs and chest pain in both the study and control groups' 100.0% and 90%, 86%, respectively. 94% of patients in both groups had previous

hospitalization, while 50% of the study and control groups, had previous thoracotomy surgery.

Table 3 reveals that the level of pain experienced by study and control group subjects at pre and post-intervention. There was an improvement in pain scores among the study group subjects at immediately postoperative day while there was a highly statistical significant difference existed between study and control groups regarding pain intensity at 3rd postoperative day at (p< 0.001).

Table 4 reveals that, there was a highly statistically significant relation between study and control groups regarding sleep quality at immediately postoperative day and 3rd postoperative day at (p < 0.001).

Table 5 shows that, there was a highly statistical significant difference in pain scores in relation to age and education level of the study group subjects at immediately postoperative day at (p< 0.001).

Table 6 reveals that, there were insignificant relation between sleep quality scores and age & education level of the studied subjects throughout the study period at (p > 0.05).

Table 7 represents correlation between total pain scores and quality of sleep among study and control grouped after intervention there were highly statistical significant differences was found as regard quality of sleep (0.000) and pain scores (P-value0.032).

Table (1): Distribution of the study subjects according to socio-demographic characteristics (N=100)

Socio-demographic characteristics	Study (n=50)		Control (n=50)		χ^2	p-value
	No.	%	No.	%		
Age / years					5. 65	0.121
20<30	8	16	8	16		
30<40	8	16	8	16		
40<50	15	30	16	32		
50 and more	19	38	18	36		
(Mean ± SD)	57.1±5.78		55.4±5.33			
Gender					0.161	0.688
- Male	26	52	28	56		
- Female	24	48	22	44		
Marital state:					4.02	0.259
- Married	39	78	33	66		
- Widow	7	14	14	28		
- Divorced	4	8	3	6		
Residence:					0.762	0.383
- Urban	13	26	17	34		
- Rural	37	74	33	66		
Income:					0.162	0.689
- Enough	22	44	22	44		
- Not enough	28	56	28	56		

Fig. (1): Distribution of the studied subjects according to their occupation (N= 100)

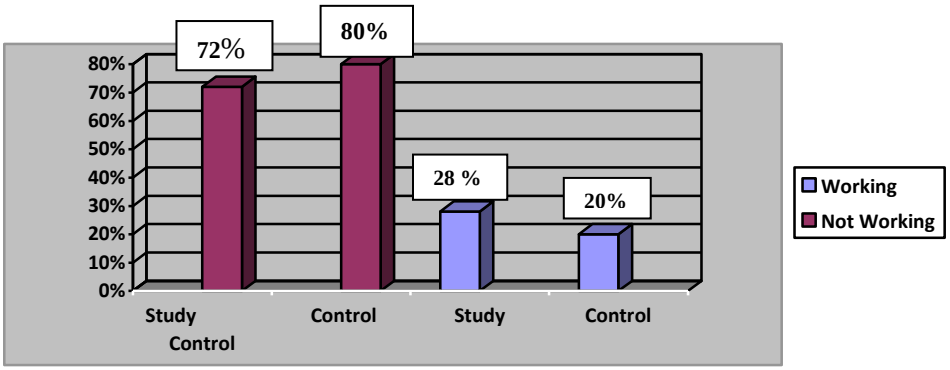

Fig. (2): Distribution of the studied patients according to their level of education (N= 100)

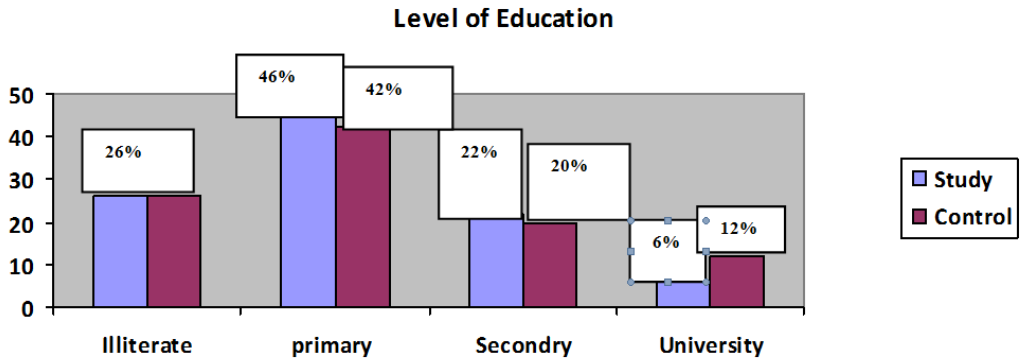

Fig. (3): Percentage distribution of patients regarding having surgical history (N= 100)

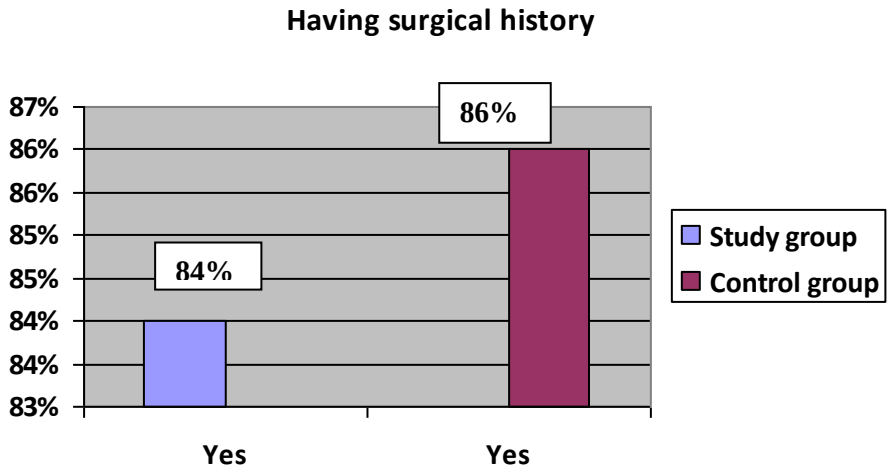

Table (2): Frequency Distribution of patients in both groups according to their medical data

Medical data	Study (n=50)		Control (n=50)	
	No.	%	No.	%
#Present complaints				
- Chest pain	45	90	43	86
- Coughing	6	12	7	14
- Pain along the ribs	50	100	50	100
Previous hospitalization				
- Yes	47	94	47	94
- No	3	6	3	6
#Type of the previous surgery				
- Coronary artery bypass grafting	14	28	15	30
- Thoracotomy	25	50	25	50
- Heart valve repair or replacement	3	6	3	6

Categories are not mutually exclusive

Table (3): Comparison between the studied groups according to the pain score at different intervals (N=100).

Pain Items	Study (n=50)		Control (n=50)		χ^2	p-value
	No.	%	No.	%		
1st preoperative day: (pre-intervention)						
- Mild	45	90	43	86	1.379	0.502
- Moderate	3	6	6	12		
- Severe	2	4	1	2		
Range	2-33		4-31			
Immediate postoperative: (post-intervention)						
- Mild	47	94	41	82	3.682	0.159
- Moderate	3	6	8	16		
- Severe	0	0	1	2		
Range	2-28		4-29			
Third day postoperative: (post-intervention)						
- Mild	50	100	43	86	7.527	**0.006****
- Moderate	0	0	7	14		
- Severe	0	0	0	0		
Range	2-12		4-19			

* Significant P < 0.05 ** highly significant P < 0.001(HS)

Table (4): Mean distribution of total sleep quality scores among both studied groups at three different intervals (N=100).

Total sleep quality scores	Study group (n=50)	Control group (n=50)	t-test	p- value
1st preoperative day: (pre-intervention)				
Range	2-14	2-14	0.027	0.978
Mean± SD	10.88 ± 3.64	10.90 ± 3.65		
Immediate postoperative: (post-intervention)				
Range	3-10	3-12	2.492	**0.014****
Mean ± SD	6.88 ± 1.80	7.88 ± 2.19		
Third day postoperative: (post-intervention)				
Range	2-9	2-12	5.806	**0.0001****
Mean ± SD	4.98 ± 1.74	7.50 ± 2.525		

* Significant P < 0.05 ** highly significant P < 0.001(HS)

Table (5): Relation between mean of total pain scores for both studied subjects regarding their age and level of education at three different intervals (N=100).

Socio-demographic characteristic	Mean of total pain scores					
	1st preoperative day		Immediate postoperative		Third day postoperative	
	Study	Control	Study	Control	Study	Control
- Age	1.08 ± 0.36	1.19 ± 0.46	8.11 ± 2.7	8.41 ± 4.45	6.83 ± 2.06	8.51 ± 4.35
- Level of education	1.29 ± 0.61	1.08 ± 0.27	13.5 ± 5.66	7.62 ± 2.53	7.93 ± 1.59	8.00 ± 2.64
t-test	1.436	0.823	4.522	0.603	1.786	0.407
P value	0.157	0.415	0.0001**	0.549	0.080	0.686

* Significant P < 0.05 ** highly significant P < 0.001(HS)

Table (6): Relation between mean of total sleep quality scores for both studied subjects regarding their age and level of education at three different intervals (N=100).

Socio-demographic characteristic	Mean scores of total sleep quality					
	1st preoperative day		Immediate postoperative		Third day postoperative	
	Study	Control	Study	Control	Study	Control
- Age	10.67 ± 4.06	10.65 ± 3.97	6.75 ± 1.74	7.84 ± 2.24	4.89 ± 1.70	7.54 ± 2.61
- Level of education	11.43 ± 2.27	11.62 ± 2.53	7.21 ± 1.96	8.00 ± 2.12	5.21 ± 1.88	7.38 ± 2.36
t-test	0.660	0.818	0.815	0.227	0.589	0.190
P value	0.513	0.418	0.419	0.821	0.559	0.850

IN- Significant P > 0.05

Table (7): Correlation between total pain scores and quality of sleep after intervention among both studied groups (N=100)

Variable	Study group (n=50)	Control group (n=50)	R- value	P –value
- **Scores of pain**	4.73 ± 0.81	6.13 ±2.16	0.240*	0.032*
- **Quality of sleep**	49.829 (0.000) *	6.581 (0.167)	0.268	0.016*

R: Pearson coefficient*: Statistically significant at $p < 0.05$

Discussion

Thoracic surgery is a great and challenging field of study. Thoracic surgery teams need to have exceptional communication skills as well as awareness of the particular illnesses and problems that can occur because many of the cases that treat can be considered life-threatening. A different reaction to the "fight or flight" response is the relaxation response. Dr. Benson claims that using the Relaxation reaction is advantageous because it mitigates the physiological impacts of stress and the flight-or-fight reaction **Mitchell (2013) &Hinkle & Cheever (2017**).

Although there are few researches on the use of the Benson Relaxation Technique following thoracic surgery, it is a non-pharmacological method that can effectively relieve pain **NCCIH (2016) &Barabady, et al. (2020)**.

The current study showed that the mean age of the study participants was 57.1 years for study group and 55.4 years for control group, respectively. Primary education made up about half of the study's subjects. Nearly three quarters of study participants were married and lived in rural areas. More than half of the participants didn't have enough income to cover their expenses.

Abd-Elraziek (2017) and Masry, et al. (2017) supported these findings, revealing that, the mean age of patients had 49.55 ± 21.10 years and around half of their study subjects had completed primary school. These results were disagreement with results reported by **Zaghloul, et al. (2022)** who reported that the mean age for the control and study groups was 24.6200±3.75992 and 25.3900±3.29338, respectively. While about an equal percentage of each group (37.5% and 46.3%) had completed secondary school.

As regard pain, the results of the current study demonstrated that after applying Benson's relaxation technique, study group participant's pain levels significantly decreased compared to control group participants, particularly notably three days before and after surgery. This result might be due to of relaxation physiology, which lowers sympathetic nervous system activity and raises parasympathetic activity by descending inhibiting nociceptive signals transmission in the spinal cord. Moreover, can significantly alter its effect on pain, and vice versa.

This result comes in agreement with **Teimouri, et al. (2019)** who reported that, there was an higher improvement in pain scores among the study group subjects after using Benson's relaxation technique than control group especially pre- and post-operative by three days .Also, this result is consistent with those of **Büyükylmaz, et al. (2011)**, who noted that the majority of patients complained of throbbing, cramping, aching, and stabbing pain at the surgery site.

This finding is compatible with a systematic review and meta-analysis was conducted by **Ju, et al. (2019)** on the assessment of the efficacy of relaxation techniques for pain relief in patients undergoing abdominal surgery confirmed the same results.

Additionally, a number of studies revealed that the Benson relaxation technique is successful at lessening pain. In addition to **Rambod**, **et al. (2014), Glowacki (2015), Raffaeli &Arnaudo (2017)** also used relaxation techniques to reduce pain in both preoperative and postoperative patients, and

their results demonstrated an improvement in the perception of pain. Also **Devmurari and Nagrale (2018)** studied the effect of relaxation techniques on controlling pain and found that they were successful in reducing pain severity.

Moreover, **Ismail and Elgzar (2018)** confirmed these findings in their study, which was conducted in Egypt and found that relaxation therapy considerably reduced the study group's level of discomfort.

On the other hand, **Good, et al. (2005)** investigated the effectiveness of relaxation techniques on abdominal surgery patients' pain. With the application of relaxation exercises, postoperative pain levels were shown to be significantly lowered.

Regarding sleep quality, the present study's findings indicated that applying the Benson's relaxation technique at one and three postoperative days improved sleep quality scores among study group compared to control group subjects**.**

From the researcher's point of view, this might be due to the approach in which the relaxation technique acts on a psycho-physiological level illustrates how both the mind and the body are involved in the process of being quiet. Training in progressive muscle relaxation results in less stimulation of the body's organs (such as less tense muscles) and lower levels of muscle-to-brain impulses. This alteration of incoming and outgoing brain impulses brings about valuable advantages as well as relaxation and rest, which improves the quality of sleep.

These findings are supported by **Masry (2017)** & **Knufinke, et al. (2018)** who founded statistically significant differences in sleep quality between the study and control groups at the one- and 3rd day postoperative. Also, this is similar to the results of a study conducted on Egyptian citizens by **Elsayed (2019)** which revealed that Benson's relaxation technique has positive effects on enhancing the total mean scores Pittsburgh sleep quality index significantly after application, indicating an improvement in the patient's quality of life.

According to the findings of the current study, there was a statistically significant difference in pain scores in **relation to age and education level** of the study group respondents at one day after surgery. While there was an insignificant relationship between sleep quality scores and age & education level of the studied patients over the period of the study. From the standpoint of the researcher, this finding can be attributed to the fact that with education, the patients are able to understand the importance of engaging in health-promoting behaviors.

Similar data were confirmed by **Masry (2017)** who reported that there was a statistically significant difference in pain scores in relation to age of the studied patients; also found that there was insignificant relation between sleep quality scores and age of the studied subjects throughout the study period.

This finding contradict with **Hajibagheri, et al. (2014)** who reported that the most common factors that can affect the sleep quality level for cardiac patients which reflected that, pain level was the first factor that can affect the sleep quality level, second factor were the patient gender in addition to the third and fourth factor were patient's qualification, while age was not a significant factor regarding sleep quality.

Regarding Correlation between total pain scores and quality of sleep among study and control groups after intervention there were highly statistical significant correlation was found as regard quality of sleep and pain scores

In my opinion, the result is logical that there's a relation between pain and the other studies variables because when the participant has pain, finds that hard to fall asleep, so impairs their quality of sleep, especially when Patientsbeing hospitalized.Alsothis finding mig ht be explained by the fact that better sleep resul ts from reduced pain.

These findings are supported by **Yeung (2016) & Zaghloul, et al. (2022)** who reported that there was statistically significant correlation effect of the level of pain on sleep quality level on the three-study period. Also, in Similar to the study's findings, **Fitri, et al. (2012)** found a positive correlation between the

degree of wound pain and the quality of sleep.

Focusing on the effect of Benson's relaxation therapy on pain and sleep quality, this study found that, when utilized by post-operative patients, it had a statistically significant effect on reducing pain levels and improving sleep quality over the duration of the three study periods.

From the researcher's point of view; this result reflected the Benson relaxation technique has a positive effect with an improvement in level of pain and quality of sleep among the study group who applied Benson's relaxation technique than the control group and proved the hypothesis of this study.

Conclusion

Based on the findings of the present study, it can be concluded that:

Implementing the Benson's relaxation therapy has a positive effect in reducing level of pain and improving quality of sleep at the post-intervention period.

The Benson relaxation technique is easy, has no reported adverse effects, and has a high level of acceptability, so it should be made available to patients post thoracic surgery whenever possible.

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Recommendations

Based on the findings of the current study, the following recommendations can be suggested:

-The Benson relaxation technique can be used by nurses to manage pain and enhance sleep quality. It's simple cost-effective therapy.

- A replication of present study can be conducted with a large sample.
- A further study to be carried out in different settings on a larger sample for a wider utilization of the Benson's relaxation therapy, in order to achieve generalization of the results.
- In order to promote patient comfort and improve tissue healing, relaxation therapy instruction should be practiced with all surgical patients.
- Replication of the study on a larger nonprobability representative sample to achieve more generalizable results.
- Examining the effect of the Benson's relaxation method on fatigue, anxiety, and quality of life throughout various stressful situations.

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