Effect of Benson's Relaxation Technique on Pain and Anxiety levels among Burn Patients

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Abstract: **Burn patients experience severe pain and anxiety despite receiving opioid analgesics. Aim: To evaluate the effect of Benson's relaxation technique on pain and anxiety levels among burn patients. Research design: quasi experimental research design was applied. Setting: The study was conducted at burn unit of Emergency Hospital, Menoufia University and Shebin Al Kom Teaching Hospital. Sample: Purposive sample of 100 adult burn patients was divided randomly and alternatively into study and control group. Tools: 1-Structured Interview Questionnaire cover sociodemographic and burn data; 2- Visual Analogue Pain Scale.3-Beck Anxiety Inventory. Results: There were highly statistically significant differences on pain and anxiety levels between the study and control groups on the 3rd day and the 5th day post intervention than pre intervention. Conclusion: Implementation of Benson's relaxation technique was effective in reducing the pain and anxiety levels among burn patients. Recommendations: Applying Benson's relaxation technique for burn patients in other places with a large sample to enhance and confirm the current study results.**

Keywords: **Benson's Relaxation Technique. Anxiety, Burn, Pain.**

1. INTRODUCTION

Burn wounds are painful, disfiguring, require intensive and extensive rehabilitation therapy, and are usually associated with long-term disability **(Meyerson, Coffey, Jones, et al. 2015).** It is estimated that 486,000 clients are treated for burns and about 40,000 are hospitalized annually **(American Burn Association [ABA], 2015)**. Worldwide, the annual deaths of burns are 265,000 **(WHO, 2014).** It is caused by a transfer of energy from thermal, electrical, radiation, or chemical source to the body **(Girtler and Gust, 2011).** Burns are classified according to the tissue destruction into first-degree burns which affect the outer layer of the skin. Second-degree burn destroys the epidermis and some of the dermis. It is painful and associated with blister formation. Healing times usually takes from 2 to 3 weeks. Third-degree burns (full-thickness) affect all skin layers, and may cause damage of deep tissue. The nerve fibers are destroyed. Fourth degree burns (deep burn) are extending into deep tissue, muscles and bone **(Kearns, Cairns, Holmes, et al., 2013)**. Major burn injuries affect more than 30% TBSA; produce both local and systemic effects **(Flores, Stockton, Roberts, et al., 2015).**

Second-degree burn (partial-thickness burn) is very painful because of the exposure of nerve endings; multiple debridement and treatments **(Hinkle & Cheever, 2018)**. Burn-related pain during procedures is associated with anxiety. Several studies revealed that procedural-pain associated anxiety increases and the patients with higher anxiety report more severe pain **(Shridharani, et al, 2010).**Pain and anxiety are common psychological problems in burn patients **(Lawrence, Mason, Schomer and Klein, 2012)**. Poor management of pain and anxiety delay wound healing, cause chronic pain, suicidal thoughts and has bad effects on life quality. Pain reduction can affect the concentration, exercise, daily routines, and patients' sleep **(Mahar, Wasiak, O'Loughlin, et al., 2012).**

Inadequate burn pain management still exists despite advances in burn care. Burn pain management is usually based on institutional preference, tradition and personal bias rather than evidence-based practices which reduces anxiety and pain **(Yang, Hur, and Kwak, 2013).**Pain management is a priority in acute stage of burn and require frequent assessment and pharmacological treatment. The high doses of morphine increase the complications as respiratory failure **(Hosseini, et al., 2016).**Therefore, Non pharmacological interventions can be used to change the patient's perceptions and responses to pain **(Wibbenmeyer, Eid, Liao, et al., 2014).**

Non-pharmacological interventions are inexpensive, non-invasive, easily administered, and lack of chemical side effects. It includes distraction, music therapy and relaxation techniques. Several studies revealed that relaxation techniques are important for pain reduction as it reduce pain, anxiety, stress, muscle tension, and decrease sympathetic nervous activity **(LeMone, 2015 ; Brown, Gerbarg, and Muench, 2013).** Benson's relaxation is one of the relaxation techniques which are identified by Benson 1975 and causes complete muscles relaxation **(Benson, 1975).** It includes mindfulness techniques that have effects on anxiety, pain, self-esteem and reduced stress **(Smeltzer S, Bare B, Hinkle J, et al., 2010)**.Nurses can independently implement non-pharmacological interventions to decrease pain during burn dressing **(Lewis, et al., 2014).** Several studied suggests that non-pharmacological interventions can facilitate relaxation and reduce anxiety **(Kreitzer & Koithan, 2014).**

Aim of study

The study aimed to evaluate the effect of Benson's relaxation technique on pain and anxiety levels among burn patients.

Research hypothesis:

 1-The study subjects exposed to Benson's relaxation exhibit less pain than control group.

2- The study subjects exposed to Benson's relaxation technique exhibit less anxiety than control group.

3- There will be a positive correlation between pain and anxiety among study group.

2. SUBJECTS AND METHODS

Design: Quasi-experimental research design was used.

Setting: This study was conducted at Burn unit of Emergency Hospital, Menoufia University and Shebin El Kom Teaching Hospital.

Sample: Purposive sample was used and consisted of 100 adult patients newly admitted to burn unit with moderate burn injuries and according to the following criteria

Inclusion criteria.

- Age ranging from 18 to 55 years

- Alert, able to communicate

- Second degree burns

- 15%-30% of (TBSA)

 Exclusions criteria:

- Concomitant injuries as fracture or poly trauma.

- Associated diseases as hepatic, renal, and cardiac or diabetes.

- Psychiatric disease and mental disabilities

Study group (1) received the education about Benson's relaxation technique and began implementation of the relaxation immediately after mastering the technique. Beside regular routine hospital care.

Control group (2) was exposed only to regular routine hospital care.

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Sampling technique:

Sample size was statistically calculated by using the Steven, K, Thompson equation at 95% confidence power of the study to be 102 patients that two patients didn't accept to participate in the study so the final number was 100 patients who are divided into 50 for each group.

$$n = \frac{N * p(1-p)}{[(N-1)*(d^2 \div z^2)] + p*(1-p)]}$$

Where:

  N= population size through past year (140 cases)

  n= sample size (102)

  Z = confidence level at 95% (1.96)

  p = Probability50% (.5 used for sample size needed)

 d= Error Proportion (0.05)

Tools of study:

1- Structured interview Questionnaire. It was developed by the researchers and involved two parts. **Part one**: assess socio demographic data as age, sex, marital status, educational level, occupation and residence. **Part two:** Assess burn data as burn place, cause, TBSA, degree of burn.

2- Visual Analogue Pain Scale (VAS)

 It is an adopted scale by Bain et al. (2005) which provides a simple way to record subjective pain intensity. The measurements are from 0-10 to rate the patient's level of pain. The measurement parameters included five items. A score of zero equal no pain while a score of 1-3 equal mild pain, a score of 4-6 used for moderate pain, a score of 7-9 equal severe pain, while a score of 10 was given to worst pain.

The reliability of the scale was tested by the retest reliability where r = 0.84 and reported that the visual analogue pain scale had excellent test–retest reliability.

 (3) Beck Anxiety Inventory (BAI) by Beck, et al., (1988). BAI scale is a self-report measure of anxiety contains 21 items. (0= Not at all) ;(1= Mildly) ;(2= Moderately) ;(3= Severely). The total score is calculated by summing of the 21 items. Low anxiety was given a score from 0-21 =; Score of 22-35 was given for moderate anxiety; and a score of 36 and above was given for sever anxiety.

Reliability: Internal consistency for the BAI = (Cronbach's a=0.92). Test-retest reliability (1 week) for the BAI = 0.75 (Beck, Epstein, Brown, & Steer, 1988).

Formal consideration:

An official permission was obtained from the directors and chief person of the hospitals and burn units to conduct this study after an explanation of the purpose of the study.

Protection of human rights:

The researchers clarified the purpose of the study and the rights of study participants, including anonymity, confidentiality, and their rights to withdraw at any time from the study. Informed consent was obtained from the patients who agreed to participate in the study.

Pilot study: -

A pilot study was conducted prior to data collection on 10% of the studied sample and revealed that it was feasible and appropriate to conduct the main study.

Data collection methods: data was collected in the period from January 2018 to December 2018 through four phases as the following:

Assessment phase: The researchers assessed patients in the burn units who met the inclusion criteria of the study. The researchers assessed socio demographic data by using Tool (1). Then, burn patient's pain and anxiety were measured by using tool (II) and tool (III) respectively on first day during dressing change for both studied groups

Planning phase: The researchers prepare to teach the study group the technique of Benson's relaxation through demonstration and re-demonstration and using videos for more clarifications.

Implementation phase: the researchers started the intervention while the burn patients in their bed in a supine position. Benson's relaxation technique (BRT) instructions for each patient in the study group were performed for 20 min and required the patients to (1) sit in a relaxed position, (2) close their eyes, (3) relax all muscles starting from the feet soles, moving forward up, and relax all parts of their body, (4) breath through their nose, pay attention to the breathing sound and say ''one'' quietly to themselves during exhalation and (5) continue for 20 min **(Bagheri, Mohseni, &Shayesteh, 2006).** And repeat every day before dressing.

Evaluation phase: the patient's pain and anxiety levels were assessed pre intervention and on the third and the fifth day post intervention during dressing change for study group as well as for the control group. Then a comparison between the study and the control group was done.

Data Analysis

Data were collected, statistically analyzed by personal computer using statistical software package (SPSS), version 19 and tabulated. Three types of statistics were completed: -

• Data were presented using descriptive statistics in the form of frequencies; Percentages (%).

• Quantitative variables were presented in the form of mean (x) and standard deviation (SD) and tested by Independent sample student t-test which is a test of significance used for comparison between two groups having quantitative variables.

• Qualitative variables were compared using a Chi-square test (χ2): was used to study association between two qualitative variables.

• The P-value of < 0.05 was considered statistically significant.

• Correlation between variables was evaluated using Pearson's correlation coefficient (r).

3. RESULTS

Table (1) Illustrated that (50 %) of the study group their age was (30- 39) years with a mean age (35.60 ±7.43) years as compared to (46%) of the control group with a mean age (36.20 ±7.06) years. About (60%) of the study group as compared to (56%) of the control group were males and workers. Also it was observed that equal percentage (94%) of the study group and control group were married. About (58%) of the study group as compared to (60%) of the control group were secondary educated. (80 % & 76%) of the study and control groups respectively lived in rural areas. There is no statistical significant difference between both study and control groups in relation to sociodemographic characteristics.

Table (2) revealed that the place where burn injury has occurred was the house for (84% and 80%) of both the study and control groups respectively. The causes of burn were also direct flame causes (60%, 58%) of both the study and control groups respectively. In relation to percentage of burn (66%, 60%) of both the study and control groups respectively had total body surface area ranged from 16% to 25%. Regarding the depth of burn, (100%) of the participants in each group had second degree. The results showed that there were no statistically significant differences between the study and control groups regarding burn assessment findings.

Table (3) showed that (100 %) of both the study and control groups reported worst pain during the first day of wound care. In comparison to the study and control groups during third day post-intervention, (62%) of the study group reported moderate pain while (50%) of the control group reported severe pain. Finally, the last day of assessment (Fifth day post-

intervention), (66%) of the study group reported mild pain while (46%) of the control group reported severe pain. The findings of the study supported the study hypothesis and showed that there were highly statistically significant differences between the study and control groups regarding pain during the 3rd day and the 5th day post intervention at P value (0.000, 0.000) respectively.

Table (4) showed the mean scores of anxiety among the study and control groups subjects at pre and post intervention. There were highly statistically significant differences between the study and control groups regarding mean scores of anxiety pre intervention and on the 3rd day and the 5th day post intervention at P value of (.542; 0.000; 0.000) respectively**.**

Table (5) revealed that there was a positive correlation between anxiety and pain at the 3rdday and the 5th day post intervention.

Figure (1) Showed that there was a significant reduction in anxiety levels among study group subjects on the third day and fifth day post intervention than control group.

Table (1): Sociodemographic characteristics of studied groups (study and control group)n=100

Sociodemographic characteristics	Study group (n=50)		Control group (n=50)		χ^2 test	P value
	No	%	No	%		
Age (years): 20 - 29	10	20	8	16	.802	.670
30 - 39	25	50	23	46		
≥ 40	15	30	19	38		
Range Mean ±SD	22-49 35.60 ±7.43		20-50 36.20 ±7.06		T=.414	.680
Sex : Male	30	60	28	56	.685	.420
Female	20	40	22	44		
Fisher's exact test						
Marital status: Single	1	1	2	4	.667	.717
Married	47	94	47	94		
divorced	2	4	1	2		
Levels of education: Illiterate	6	12	4	8	.611	.894
Preparatory	11	22	9	18		
Secondary	29	58	30	60		
High education	6	12	7	14		
Occupation: House wife	20	40	22	44	.545	.343
Worker	30	60	28	56		
Residence Rural	40	80	38	76	.629	.405
Urban	10	20	12	24		

Table (2): Number and percentage of studied groups according to burn assessment findings n=100

Burn assessment findings	The studied patients with burn wound (n=100)				χ^2	P
	Study group (n=50)		Control group (n=50)			
	N	%	N	%		
Burn place:						
Inside house	42	84	40	80	.638	.424
Outside house	8	16	10	20		
Cause of burn:						
Hot water and liquids	18	36	20	40		
Direct flame	30	60	29	58	.456	.796
Chemicals	2	4	1	2		
Total body surface area (%)						
16 - 25	33	66	30	60	.386	.534
26 – 30						
	17	34	20	40		
Mean ±SD	23.8 ± 6.19		24.66 ± 5.94		T=.708	.480
Depth of burn:						
Second degree	50	100	50	100	NA	NA

Table (3): Distribution of studied groups according to their pain level through three assessments (pre intervention, 3rd day post intervention and 5th day post intervention) n=100

Degree of Visual Analogue scale (VAS)	The study patients with burn wounds (n=100)				χ^2	P
	Study group (n=50)		Control group (n=50)			
	N	%	N	%		
▪ **First day: (pre-intervention)**						
Worst pain (10)	50	100	50	100	-	-
Third day (post-intervention)						
No pain (0)	0	0	0	0		
Mild pain (1-3)	10	20	6	12		
Moderate pain (4-6)	31	62	12	24	21.920	.000
Severe pain (7-9)	6	12	25	50		
Worst pain (10)	3	6	7	14		
Range	3-10		3-10		T= -4.945	
M ± SD	5. 02 ±1.91		7.04 ±2.16		P .000	
Fifth day (post-intervention)						
No pain (0)	0	0	0	0		
Mild pain (1-3)	33	66	10	20	33.267	.000
Moderate pain (4-6)	15	30	14	28		
Severe pain (7-9)	2	4	23	46		
Worst pain (10)	0	0	3	6		
Range	2-7		3-10		T= 9.20	
M ±SD	3.1 ±1.21		6.14 ±1.96		P .000	

*Significant (P<0.05)

Table (4): Distribution of studied groups according to their anxiety scores through three assessments (pre intervention, 3rd day post intervention and 5th day post intervention) n=100

Anxiety	Studied group n= 100		t- test	P value
	Study n=50	**Control n= 50**		
First day (pre intervention)				
Range	26-50	26- 49	.611	.542
Mean ±SD	37.68 ± 6.68	38.48±6.47		
3rd day (post intervention)				
Range	16- 40	19- 47	4.75	.000
M ± SD	28.48 ±7. 54	35.44 ±7.08		
5th day (post intervention)				
Range	9- 31	16- 45	9.18	.000
M ± SD	17.88 ±8.17	32.88 ±8.12		

Table (5) Correlation between total scores of anxiety and pain of study group at two intervals (3rd day post intervention and 5th day post intervention)

Item	3rd day post intervention		5th day post intervention	
	r	P	R	p
Anxiety and pain `	.898	0.001	.880	0.001
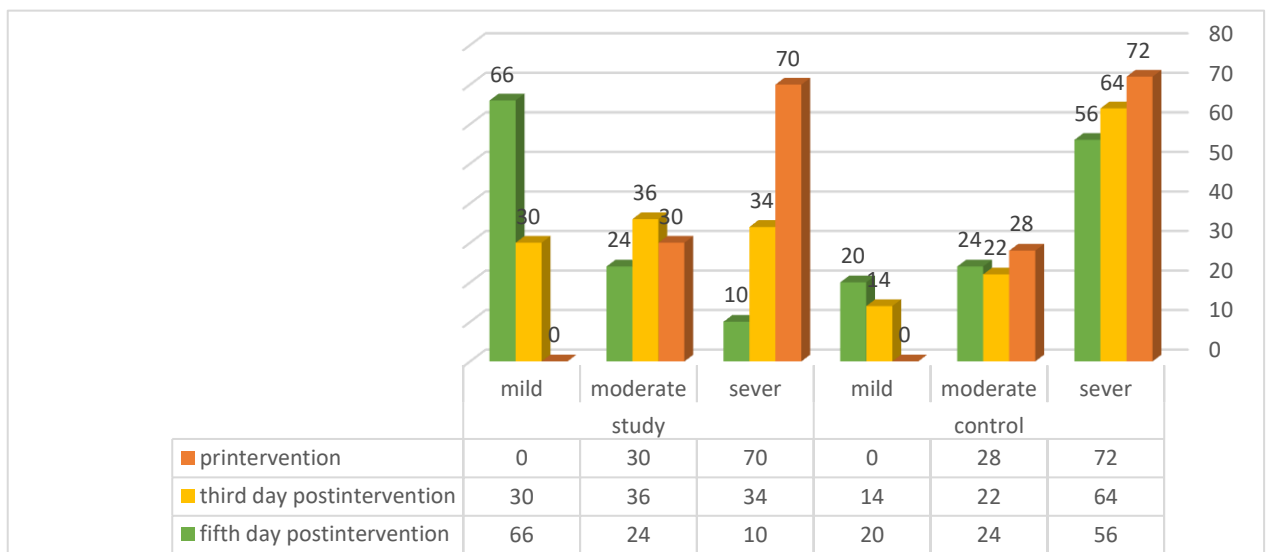
Figure (1): Anxiety levels in studied groups through three assessments (pre intervention, 3rd day and 5th day post intervention) (n=100)

4. DISCUSSION

The combination of relaxation with analgesics provides a wide-ranging of pain relief for patients **(Rafii, Mohammadi, and Jamshidi, 2013)**. This study aimed to investigate the effect of Benson's relaxation technique on pain and anxiety levels among burn patients.

Regarding to the socio-demographic characteristics of the studied groups, the present results showed that the mean age of study and control groups was 35.60 years and 36.20 years respectively. This result was in the same line with Latenser et al., (2009) who reported that the mean age for all patients was 35 years old. On the contrary, Gowri, Vijaya, Powar, and Honnungar, (2012) reported that the mean age was 29.32 years. This difference might be due to that burn can occur at any age. In relation to sex, the present study illustrated that more than half of the studied subjects were males. This result was supported by the results of Afify et al., (2012), who reported that most of burned patient were males. Moreover, American Burn Association National Burn Repository [ABA NBR], (2015) mentioned that men have more than twice incidence of burn injury than women. On the contrary, Gowri Vijaya, Powar, and Honnungar, (2012) reported that more than half of the burn patients were females. This might be due to that the males had special work circumstances as industrial and manual works.

As regards to marital status, the study findings revealed that the majority of the studied groups were married. This result was consistent with the results of Elsherbiny (2010). On the other hand, Tabassum, (2009) reported that most of the studied sample were single. This may indicate that married people are over loaded or preoccupied with responsibilities or have less concentration when contacting with dangerous substances. The findings of the present study illustrated that, the majority of studied groups were secondary educated. This might be the cause of lack of knowledge about safety precautions that increase risk of burn injury. This result was in line with the results of Gowri Vijaya, Powar, and Honnungar (2012). On the other hand, Elsherbiny (2010) reported that most of burned patients were illiterate. The results of the present study illustrated that, most of the studied groups were workers and about one third was housewives. This result was in line with Mazumder and Patowary (2013). **Regarding to Residence**, the present findings illuminated that, most of the studied sample lived in rural areas. This might be the cause of lack of safety precaution application in rural areas which can expose people to high risk of burn injuries. Also, inadequate health services in rural areas, unsupervised and careless handling of gas pipes without safety features and kerosene stored at the home increase the risk of fire. This result was in agreement with the results of Elsebaie (2006).On the contrary, Hemeda, (2003) reported that more than two thirds of burned patients were from urban areas.

The present findings revealed that burn place was inside the house for the most of studied groups and the cause of burn was thermal. This finding is in agreement with Dongo et al. (2007) who mentioned that the majority (91.4%) of burn injuries occurred at the home as a result of flame. This result was supported by American Burn Association, (2011) which reported that exposure to flame and fire are the most common causes of burn. On the contrary, Hemeda, (2003) mentioned that electrical injury was the cause of burn.

Regarding to pain level, the current findings indicated that both studied groups stated worst pain during the first day (pre intervention) while there was a significant reduction of pain on the third day and the fifth day post intervention. These results are consistent with Pouran, et al., (2013) who mentioned a significant difference in the severity of pain among the studied subjects before and after intervention. This result was supported by Fayazi et.al, (2010) who mentioned that Benson muscle relaxation was effective in relieving pain. This might be due to the effect of Benson's relaxation on burn pain. Moreover, according to the gate control theory, relaxation can decrease or eliminate the pain through inhibitory impulses from the cerebral cortex and thalamus which result in closing the gate. Relaxation reduces pain and anxiety by liberating endorphins (Rafii, Mohammadi, and Jamshidi, 2013).

In relation to anxiety, the current findings demonstrated a significant reduction in the anxiety level on the third day and the fifth day post intervention than pre intervention among study group than control group. This result is consistent with Morsy, Elsaay and Alam (2014) who declared a significant improvement of BSPAS after application of relaxation techniques than pre relaxation. This might be due to that the patients' expectation of pain that occur during dressing increases their anxiety levels. Moreover, Robert (2000) illustrated that burned patients had high levels of anxiety before wound care. Similarly Turner (1998) added that there was a significant decrease in anxiety level among patients who

received relaxed music therapy during burn dressing. This difference may be related to the effect of Benson's relaxation on the patients' anxiety. The current results displayed a positive correlation between anxiety and pain at the third day and the fifth day post intervention. This may be due to the effect of Benson's relaxation on pain and anxiety reduction. This result was in the same line with the results of Shridharani , et al.2010). This result was supported by Corry, Klick and Fauerbach (2010) who reported that patients with higher rates of anxiety suffered from extreme pain.

5. CONCLUSION

 Benson's relaxation technique is effective in reducing pain and anxiety in burn patients during dressing change.

6. RECOMMENDATIONS

Applying Benson's relaxation technique for burn patients in other places with a large sample to enhance and confirm the current study results.

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