International Journal of Advance Research in Medical Surgical Nursing

E-ISSN: 2663-2268
P-ISSN: 2663-225X
IJARMSN 2020; 2(2): 85-88
Received: 24-08-2020
Accepted: 03-10-2020

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Effectiveness of biofeedback mechanism in reducing the pain in patient with cancer

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Abstract
Cancer is a disease caused when cells divide uncontrollably and spread into surrounding tissues. Biofeedback technique is used to manage anxiety, stress and certain symptoms that many people living with cancer experience. This study aims to assess the effectiveness of biofeedback mechanism in reducing pain in patient with Cancer. The research design was used quasi experimental design. Non probability sampling method was used to select the 60 cancer patients, were divided into two groups, 30 patients in control group and 30 patients in experimental group. Outcome was assessed by using pain analogue scale in both for patient undergoing chemotherapy treatment. In experimental group patients showed reduction in Pain after biofeedback mechanism during chemotherapy when compared to control group. These findings suggest that biofeedback can be effective in reducing some level of pain and that the positive effects found for biofeedback. The data gathered was analyzed by using descriptive and inferential statistics. The paired 't' test value if t= 8.2892, It is significant at the level of P= 0.0001(S*). The above findings showed that biofeedback mechanism was effective intervention in reducing pain among cancer patients with chemotherapy.

Keywords: Biofeedback, mechanism, reducing, pain, patient

Introduction
Cancer was recognized in ancient times by skilled observes who gave the name 'cancer' (Latin word cancer – crab) because it stretches out in many directions like the legs of crab. The word umbrella is used to describe cancer as a group of more than 270 diseases in which cells profile rate without restraint, destroy healthy tissues thus endangering life.

Cancer is therefore a generic term used to describe a group of at last a hundred diseases that occur when malignant forms of abnormal cell growth develop in one or more body organs. Cancer arises a series of genetic mutations remove the normal checks on cell growth. These cancer cells continue to divide and grow to produce tumors. Cancer cells can invade adjacent structures and spread via the lymph or blood to distal organs. Some of the biological mechanisms that change a normal cell into a cancer cell are known while others are not yet known. Cancer differs from most other disease in that it can develop at any stage in life and in any body organ. No two cancer cases behave exactly alike. Some may follow an aggressive course, with cancer growing rapidly. Other types grow slowly or may remain dormant for years. Very high cure rates can be achieved for some types of cancers, but for others the cure rates disappointingly low and await improved methods of detection and treatment. The wide range of cancer treatments and associated services reflects the biological diversity of cancer. The most common stage of cancer at diagnosis, the rate of progression, and the treatment options vary significantly with the type of cancer a patient presents.

The prevalence of cancer pain have varied widely, mainly because of a lack of standardization in definitions of pain and in the measures used to assess it, and because of the heterogeneity of nociceptive and neuropathic pain conditions. Other factors contributing to the wide variation in results include the heterogeneity of cancer diagnoses (breast, lung, etc.) and the types of treatment settings in which the studies were conducted (outpatient, inpatient, or community settings). In general, the prevalence of pain at the time of cancer diagnosis and early in the course of disease is estimated to be approximately 50%, increasing to 75% at advanced stages. A recent meta-analysis found the prevalence of pain in cancer survivors to be 33%. One strategy for evaluating the prevalence of pain in cancer patients is to consider the following categories: pain related to the cancer, to its treatment, or to unrelated causes.

Biofeedback does not cure cancer, it can be used to manage anxiety, stress and certain symptoms like pain that many people living with cancer experience. It's often difficult to relax if the patient is undergoing cancer treatment, but Biofeedback can help the Patient to learn better control of body's response to stress and Pain. Biofeedback session shows you different relaxation techniques which, according to the National Center for Complementary and Integrative Health, include: Deep breathing, Guided imagery, Mindfulness meditation, Progressive muscle relaxation, Self-hypnosis and Diversional therapy. This study aims to assess the effectiveness of biofeedback mechanism in reducing pain in patient with Cancer.

Method and Material

The main study was conducted in Saveetha Medical College and Hospitals. Data collection was done for a period of 1 week. The investigator obtained written permission was obtained from each participants prior to the study. The oral permission was obtained from each participant's prior study. The purpose of the study was explained to the subjects. Based on the inclusive criteria 60 samples were selected by using purposive sampling technique. Researcher took the samples from the first 3 shifts of the patients with cancer. Demographic variables was collected by interview then pretest was conducted to the participants by using pain analogue scale and biofeedback mechanism was given to the participants individually for 3 days advised the patients to recall the pleasant memories during chemotherapy. Each session lasts for 15 minutes per day, and each day observe the patients up to 3 days. On the 4th day posttest was conducted by using the same tool. The same procedure has been followed for all samples of the patients with cancer. Where as in control group 30 samples was followed by daily routine care. The data were collected, analyzed and tabulated.

Result and Discussion

Distribution of demographic variables among patient with cancer. Regarding age majority of patients 11(36.66%) belongs to the age group of 70-79years, 9(30%) belongs to 55-49 years, 8(26.66%) belongs to 21-45years, 2(6.66%) belongs to >80 years. Regarding sex majority of patients 17(56.66%) were male and 13(43.33%) were females.

These findings of Daniela Kraemer (2018) *et al*., who reported that while the lowest portion of women compared to men on cancer was observed. Regarding marital status majority of the patients 25(83.33%) were married. Regarding educational status, majority of the patients has no formal education, 15(50%), regarding occupation majority of 17(56.66%) were unemployed, these findings consists with study findings Paul paras Braw (2017) *et al*., who reported that employment of hemodialysis patients 16(53.33%) were unemployed and 11(37.66%) were employed. With regards religion most of them were Hindu.

With regard with family monthly income majority of in between Rs.5000-10000, 10(33.33%) were in between Rs.10000-15000, 3(10%) were in between Rs.15000& above.

Regarding duration of illnes majority of patients 20(66.66%) had duration of illness for one year, 5(16.66%) had duration of illness for 9 months-1year, 3(10%) had duration of illness for 5-8months, 2(6.66%) had duration of illness for 1-4months.these findings are consistent with the findings of asimisalazoidos (2019) *et al*., who reported incidence of chemotherapy with cancer for start as divided into early, intermediate and late periods.

Regarding types of cancer majority of 15(50%) had gastrointestinalcancer1, 6(20%) had hematological cancer, 5(16.66%) had other types, 4(13.33%) had gynecological cancer. Regarding cycles of chemotherapy majority of 20(66.66%) had above 6 cycles, 5(16.66%) had 5-6cycles, 3(10%) had 3-4cycles, 2(6.66%) had 1-2cycles.

1. The first objective was to assess the effectiveness of biofeedback mechanism in reducing then pain in patient with cancer

Biofeedback does not cure cancer, it can be used to manage anxiety, stress and certain symptoms like pain that many people living with cancer experience. It's often difficult to relax if the patient is undergoing cancer treatment, but Biofeedback can help the Patient to learn better control of body's response to stress and Pain.

In the pretest level of pain majority of 22(73.33%) had moderate pain and 8(26.66%) had severe pain, whereas in posttest majority of 22(73.33%) had mild pain and 8(26.66%) had moderate pain. The study findings are consistent with findings of Senthil p Kumar *et al*., who reported the high prevalence of pain problems reported in during chemotherapy, over 70% of cancer patients suffer severe pain. The age of study population was 37.1+ (range 20-65 years) with 89.3% being males 47.7%being females reported pain during chemotherapy.

2. The second objective was to compare the pain of patient who takes and does not take biofeedback mechanism

The data analysis shows that in experimental group the mean pretest score level of pain 3.68 SD (3.14) and posttest mean score is 1.84 SD (1.57) and mean difference is 40. The paired't' value 8.2892 which was a significant P = 0.0001($P< 0.5$)S*

Whereas in control group the mean pretest score level of pain 3.76 SD (3.17) and posttest mean score is 4.08 SD (3.44) and the mean difference is 49. The paired't' value 4.1061 which as non-significant P= 0.7(P > 0.5) NS*the experimental group is lower than control group and its significant.

The study findings are consistent with the findings of davidc. Curroue (2020) et at., conducted prevalence of therapeutic effect of biofeedback mechanism in cancer patients there was a significant reduction in pain 12.7% reduction; P = 0.010

Therefore the research hypothesis experimental group is lower than control group was accepted.

3. The third objective was to find the association between posttest level of pain and selected demographic variables among cancer patients in experimental group

The result revealed that cancer patients majority of 9(30%) between 55 – 69 years of age were results of having mild level of pain. most of them 15(50%) were males who had mild level of pain nearly half of the cancer patients 12(40%) has no formal education which reveals that poor awareness also could be contributing factor among 30 cancer patients 16(53.3%) were unemployed invariably. This resulted into economic burden to the family. Their was no significant between pretest level of pain and demographic variables

such as sex, education, religion, income, duration of illness, types of cancer, cycles of chemotherapy among cancer patients of intervention group at the level of $p< 0.05$
Another study supports the results that there is no significant association exist between the level of pain among cancer patients with selected demographic variables like sex, education, religion, income, duration of illness, types of cancer, cycles of chemotherapy at the level of $p< 0.05$ Mariantonietta mazzololi 2018

Table 1: Frequency and percentage distribution of pretest and posttest level of pain among patients with cancer in experimental group

Assessment of Pain Score	Mild Pain		Moderate Pain		Severe Pain		Mean S.D	
	F	%	F	%	F	%		
Pretest	0	0	22	73.33	8	26.66	3.68	3.14
Posttest	22	73.33	8	26.66	0	0	3.14	1.57

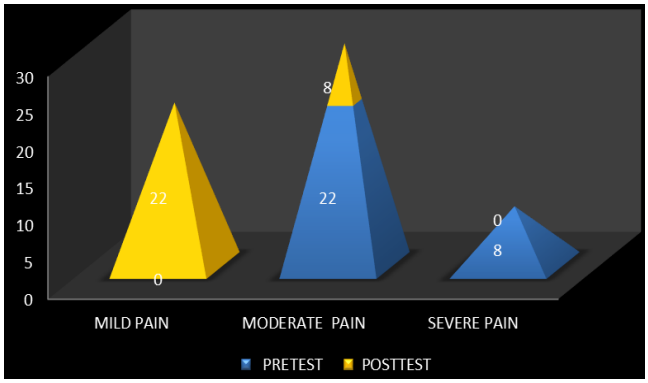

Fig 1: Level of pain in experimental group

Depicts that in pretest level of pain, majority of the patients 22(73.33%) has moderated level of pain, and 8 (26.66%) has severe level of pain, where as in posttest 22(73.33%) has mild level of pain, and 8 (26.66%) has severe level of pain.

Table 2: Frequency and percentage distribution of pretest and posttest level of pain among patient in control group

Assessment of Pain Score	Mild Pain		Moderate Pain		Severe Pain		Mean S.D	
	F	%	F	%	F	%		
Pretest	0	0	22	73.33	8	26.66	3.76	3.17
Posttest	1	3.33	22	73.33	5	16.66	4.08	4.08

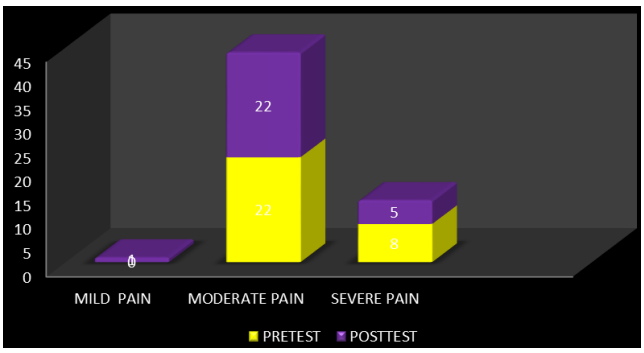

Fig 2: Level of pain in control group

Depicts that in pretest level of pain, majority of the patients 22(73.33%) has moderated level of pain, and 8 (26.66%) has severe level of pain, where as in posttest 22(73.33%) has mild level of pain, and 5 (16.66%) has severe level of pain.

Table 3: Effectiveness of Biofeedback mechanism among patients with cancer in experimental group by using paired 't' test

Experimental Group				Paired 'T' Test
Pre Test		Post Test		T = 8.2892
Mean	Sd	Mean	Sd	P = 0.0001
3.68	3.14	1.84	1.57	S*

The above table reveals that there was a reduction in level of pain. It shows that biofeedback mechanism was effectiveness in reducing the level of pain among cancer patients.

Table 4: Effetiveness of biofeedback mechanism among cancer patients in experimental and control group using unpaired 't' test

Test	Experimental group		Control group		Unpaired t test
	Mean	Sd	Mean	Sd	
Pre test	3.68	3.14	3.92	3.33	T = 0.3708
Post test	1.84	1.57	3.76	3.17	T = 3.8358

The above table reveals the unpaired 't' test between pretest and posttest in experimental and control group, it shows pretest p = 0.7116 NS*(non-significant) posttest p = 0.0002 S*(significant)

Conclusion

The study proves that the effectiveness of biofeedback mechanism was reducing the level of pain among cancer patients during chemotherapy at SIMATS so the biofeedback mechanism was effective in reducing level of pain among cancer patients.

Acknowledgement

We would like t extend our gratitude to the authorities of Saveetha College of Nursing and Saveetha Medical College and Hospitals.

Author's Contribution

All the authors actively participated in the work of the study. All authors read and approved the final manuscript.

Conflicts of inters

The authors declare no conflicts of interest.

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