



A COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF DEEP BREATHING EXERCISE INCENTIVE SPIROMETER AMONG POST OPERATIVE PATIENTS UNDERGONE ABDOMINAL SURGERY IN SELECTED HOSPITAL OF INDORE(M.P.)

Mrs. Reena Thakur

Associate Professor, Index Nursing College, Indore

Conflicts of Interest: Nil

Corresponding author: Mrs. Reena Thakur

Abstract:

A comparative study was done to assess the effectiveness of deep breathing exercise incentive spirometer among post-operative patients undergone abdominal surgery. The aim of this study was to compare the effects of IS and DBE on respiratory parameters. 40 samples were selected through purposive sampling technique and divided in deep breathing exercises (20 sample) and incentive spirometer (20 sample) group at Index Hospital. Data were collected through assessment of respiratory parameters of post operative patients for 3 days. Data was analyzed by computed value of deep breathing exercise group ($t = 17.7$) which was significant at $P \leq 0.001$ level and the computed t value of Incentive Spirometer group ($t = 16.02$) which was significant at $P \leq 0.001$ which indicates that planned interventions are very effective. The incentive spirometer breathing exercise was better than deep breathing exercise as posttest mean score 10.55 was significantly more than that of deep breathing exercise i.e. 9.66. Pulmonary complications usually occur in post-operative patients after abdominal surgery and breathing exercises are very effective to prevent post operative respiratory complications.

Keywords: Deep Breathing Exercise, Incentive spirometer, respiratory parameters

Introduction

Abdominal surgeries are associated with a high risk of post operative pulmonary complications. The risk and severity of post operative pulmonary complications can be reduced by the use of breathing exercises. Controversy exists regarding the routine use of aids to lung expansion in the prevention of pulmonary complications after abdominal surgery between deep breathing exercise and incentive spirometer.

The deep breathing exercises (DBE) will not require any mechanical resource and aim at lung expansion through slow and uniform nasal inspiration, followed by relaxed oral expiration. The incentive spirometer (IS) also emphasizes deep inspiration up to total lung capacity, providing visual feedback. Both techniques are commonly used, dependent on the cooperation of the patient, but with easy fulfillment.

The aim of this study was to compare the effects of IS and DBE on spirometric variables partial oxygen pressure (spo_2), respiratory rate, pulse rate and oxygen saturation ($S O_2$) in patients undergone abdominal surgeries.

OBJECTIVE:

- To assess the respiratory parameter of post operative patients before and after deep breathing exercise among post operative patients undergone abdominal surgery
- To assess the respiratory parameter of post operative patients before and after breathing exercise with incentive spirometer among post-operative patients undergone abdominal surgery
- To compare the respiratory parameters of post operative patients of both groups.

HYPOTHESIS

H1- There will be significant difference in the respiratory parameters of post – operative patients before and after deep breathing exercise group at the level of $p \leq 0.05$

H2 - There will be significant difference in the respiratory parameters of post – operative patients before and after incentive spirometer group at the level of $p \leq 0.05$

H3—comparison of respiratory parameters of post operative patients of deep breathing exercise and incentive spirometer group at the level of $P \leq 0.05$

Material & Method

Research design selected for study was Quasi experimental non equivalent control group design because the study intended to compare the effectiveness of deep breathing exercise incentive spirometer among post-operative patients undergone abdominal surgery. Conceptual used in study was based on patient centered approach theory of **Faye Glenn Abdellah (1960)**. The problem solving method is the basis for Abdellah’s model.

The study was conducted at Index Hospital, Indore. Population of the study was consisted of post-operative patient’s undergone abdominal surgery. Purposive sampling technique was used to select 40 samples in which 20 samples of deep breathing exercise group and 20 samples of Incentive Spirometer group. For study data was collected for one month and patients did the breathing exercise for 3 days. Before initiating exercise pre test and after 3 days post test for assessment of respiratory parameters was done.

Tool

The tool used in this study was a planned interventions with two sections:

Section A –demographic data include description of samples according to age, sex, education, occupation, any bad habits, chronic lung disease and total family income.

Section B – planned intervention include measuring respiratory parameters partial oxygen pressure(spo₂) , respiratory rate , pulse rate and oxygen saturation (S O₂) before breathing exercise and after 3 days of breathing exercise. Daily breathing exercise was done by patients 3 times.

RESULT

There was equal distribution of subjects in both the interventions. In study majority of 32% sample belong to age group 40-50 years and 2% samples belongs to 65 years and above age group.

Regarding gender majority of subjects were male (62%) and 37% subjects were female.

Regarding education 35% were illiterate, 25% were educated up to primary level , 17% were educated up to primary level and 2% were graduated.

Regarding occupation majority of subjects were farmers (67%) and 7% subjects were housewife’s.

Regarding bad habits 30% subjects were involve in tobacco chewing, 25% subjects were smokers and 27% were consuming alcohol.

Regarding chronic lung disease, 15% subjects having chronic lung disease.

Regarding family income majority of subjects belongs to income above yearly more than 10000 (97%).

Table 1: shows the comparison of respiratory parameters of post – operative patients before and after deep breathing exercise

Respiratory parameters	Mean Score	Mean Difference	S.E.	df	t value
Pre Test	4.7	5.49	0.30	38	17.7***
Post Test	10.20				

*** Highly significant

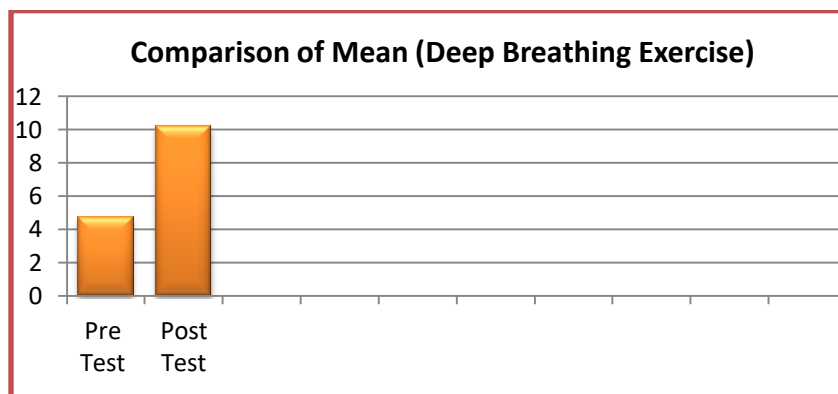


Figure 1: Showing comparison of pretest and posttest of Deep Breathing Exercise group

Table 2: Shows the comparison of respiratory parameters of post – operative patients before and after Incentive Spirometer

Respiratory parameters	Mean Score	Mean Difference	S.E.	df	t value
Pre Test	4.7	5.59	0.35	38	16.02 ***
Post Test	10.29				

*** Highly significant

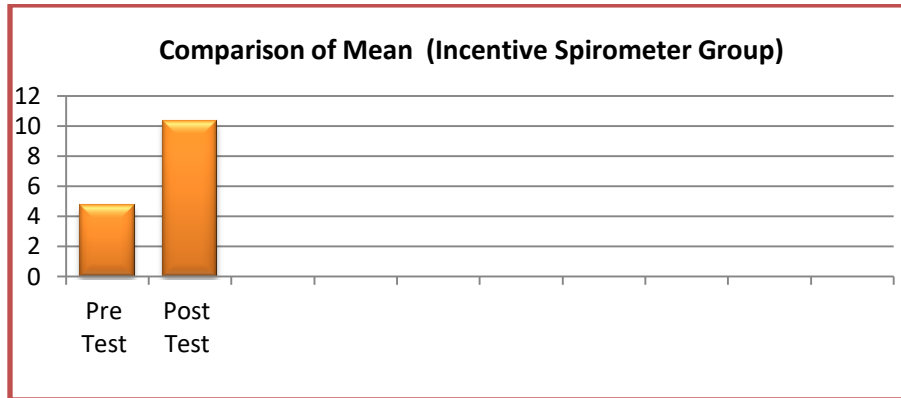


Figure 2: Showing comparison of pretest and posttest of Incentive Spirometer group

Table 3: shows the comparison of respiratory parameters of post – operative patients deep breathing exercise and Incentive Spirometergroup

Method	Post Test Mean SD	t value	df	SEM	Confidence Interval	P value
Deep Breathing Exercise	9.67	0.38	38	0.26	0.67 to 0.43	P ≤ 0.05*
Incentive Spirometer	10.56					

* Significant

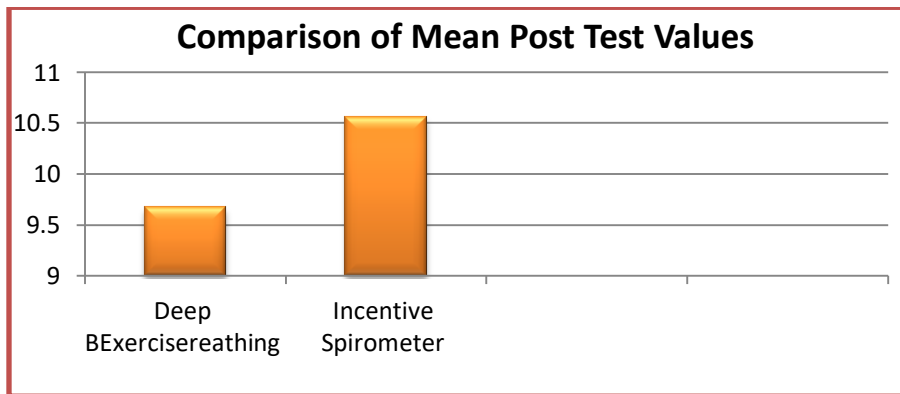


Fig 3 Showing comparison of mean posttest values of Deep Breathing Exercise and Incentive Spirometergroup

The result of the study showed that the computed value of deepbreathing exercisegroup was (t = 17.7) which was significant at P ≤ 0.001 level and the computed t value of Incentive Spirometer group was (t = 16.02) which was significant at P ≤ 0.001. This indicates that planned interventions are very effective. The Post value of two groups has been compared to find out the better technique. The

incentive spirometer breathing exercise was better than deep breathing exercise as posttest mean score 10.55 was significantly more than that of deep breathing exercise i.e. 9.66.

Discussion

Above results supported by a study conducted by **Julia Alencar Renault (2009)** to compare the effects

of deep breathing exercises (DBE) and the flow-oriented incentive spirometry (IS) in patients undergone coronary artery bypass grafting (CABG) through the following variables: forced vital capacity - FVC, forced expiratory volume in 1 second - FEV₁, maximal respiratory pressures and oxygen saturation. Thirty six patients in CABG postoperative period underwent thirty minutes of non-invasive ventilation during the first 24 hours after extubation and were randomly shared into two groups as following: DBE (n=18) and IS (n=18). The spirometric variables were assessed on the preoperative period and seventh postoperative day (POD). The respiratory muscle strength and oxygen saturation were assessed on the preoperative period, first, second and seventh POD. The groups were considered homogeneous in relation to the demographic and surgical variables. It has been noted fall in the values of FVC and FEV₁ between the preoperative period and the seventh POD, but without significant differences between groups. The maximal respiratory pressures showed drop in the first POD but with gradual and partial recovery until the seventh POD, also without significant differences between groups. The oxygen saturation was the only variable that was completely recovered on the seventh POD. There were not observed significant differences in maximal respiratory pressures, spirometric variables and oxygen saturation in patient's undergone deep breathing exercises and flow-oriented incentive spirometer after coronary artery bypass grafting.

Conclusion

Pulmonary complications usually occur in post-operative patients after abdominal surgery. These complications affect the respiratory status of patients. Main aim of study was to compare deep breathing exercise and incentive spirometer among post-operative patients undergone abdominal surgery. There were incentive spirometer was the

more effective method for breathing exercise than deep breathing exercise.

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