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A Quasi Experimental Study to Assess the Effectiveness of Abdominal Binder on Ambulatory Pain among Post-operative Patients at Selected Hospital, Coimbatore

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ABSTRACT

Abdominal binders are effective in reducing ambulatory pain and improving early ambulation. The study aimed to identify the effect of abdominal binder on ambulatory pain among post-operative patients with abdominal surgery. Quasi-experimental post-test-only control group design was adopted in this study. 30 patients in experimental group and 30 patients in control group were selected based on inclusive and exclusive criteria by using purposive sampling technique. The demographic variables and clinical variables were collected from the postoperative patients. Abdominal binder was applied to the experimental group and the control group received routine postoperative care. Post-test was done for both groups to assess the ambulatory pain by using a numerical pain rating scale twice a day for first three postoperative days. It was identified on the first day that the mean levels of ambulatory pain for the experimental and control group were 8.35 and 9.07 with a mean difference of 0.72. Standard deviations were 0.787 and 0.435 respectively. The calculated value of 0.286 was less than the table value at 0.05 leve of significance. On the second day mean levels of ambulatory pain for the experimental and control group were 5.93 and 7.28 with a mean difference of 1.35. Standard deviations were 0.81 and 0.692 respectively. The calculated value of 6.035 was greater than the table value at a 0.001 level of significance. On the third day mean levels of ambulatory pain for the experimental and control group were 3.28 and 5.18 with a mean difference of 1.9. Standard deviations were 0.663 and 0.748 respectively. The calculated value of 3.653 was greater than the table value at a 0.001 level of significance. Hence, the researcher concludes that the abdominal binder is a non-elastic, cost effective method on reducing the ambulatory pain among postoperative patients.

KEYWORDS: Abdominal binder, post-operative patients, early ambulation**,** postoperative care**,** abdominal surgery

INTORDUCTION

Pain is an unpleasant sensory and emotional experience which may be associated with actual or potential tissue damage. Surgical trauma induces hyperalgesia which could lead to chronic pain in the postoperative period when left unattended (Sundeep, 2018).The effective relief of pain is of the utmost importance to treating patients undergoing surgery. Pain relief has significant physiological benefits hence, monitoring of pain relief is increasingly becoming an important postoperative quality measure. The goal for postoperative pain management is to reduce or eliminate pain and discomfort with a minimum of side effects (Veerabhadram Garimella,2013) Post-Surgical Pain is common and expected after surgery. Effective post-surgical pain management is associated with patient satisfaction, earlier mobilization, shortened hospital stays, and reduced costs. The goal of pain management following a surgical procedure is to prevent and control pain (Saramma,2010).

NEED FOR THE STUDY

Globally, a staggering 310 million major surgeries are performed each year. It is estimated that 1–4% of these patients will die, up to 15% will have serious postoperative morbidity, and 5–15% will be readmitted within 30 days. (Dobson GP, 2020). After abdomen surgery, participants should support the incision area with a pillow or their hands during mobilization. Although, it is not possible to provide constant support all the time; hence, using an abdominal binder is a practical and common application that helps mobility and recovery. It has been reported that using abdominal binder might decrease the pain following major abdominal surgery by limiting motion and supporting abdominal wall during recovery period, compression at surgical site, increases blood flow and reduces inflammation, accordingly improves rapid tissue repair. Some studies specified that additional benefits of abdominal binder including the prevention of herniation, wound seroma and hematoma (Boonploeng et al., 2021). These facts stimulated the researcher to investigate the effectiveness of abdominal binder on ambulatory pain among postoperative patients.

STATEMENT OF THE PROBLEM

A Quasi Experimental Study to Assess the Effectiveness of Abdominal Binder on Ambulatory Pain among Post-operative Patients at Selected Hospital, Coimbatore.

OBJECTIVES OF THE STUDY

- To assess the level of ambulatory pain among postoperative patients
- To evaluate the effectiveness of abdominal binder on ambulatory pain among postoperative patients.
- To find out the association between the level of ambulatory pain andselected variables among postoperative patients.

OPERATIONAL DEFINITION

Effectiveness

Effectiveness refers to the changes in the level of ambulatory pain after the application of abdominal binder among postoperative patients. It is measured by Numerical Pain Rating Scale (NPRS) twice a day for first three postoperative days.

Abdominal Binder

Abdominal binder refers to a non-elastic belt that encircles abdomen. It is used to support the incisional

site by compressing and stabilizing the abdominal muscles for patient who underwent abdominal surgeries.

Ambulatory Pain

It refers to the pain experienced by the patient during ambulation after an abdominal surgery, as measured by numerical pain rating scale.

Postoperative patients

It refers to patients who underwent open abdominal surgery with vertical incision.

Hypothesis

H_1 -There is a significant difference in the level of ambulatory pain after the application of abdominal binder in experimental group and control group.

H_2 - There is a significant association between the levels of ambulatory pain and selected variables among postoperative patients.

METHODOLOGY

RESEARCH APPROACH: Quantitative Approach

RESEARCH DESIGN: Quasi- experimental post test only control group design.

RESEARCH SETTING: The study was conducted in, surgical, post-operative ,gynecology and special wards at Sri Ramakrishna Hospital, Coimbatore

TARGET POPULATION

Patients who underwent abdominal surgery in Coimbatore

ACCESSIBLE POPULATION

Patients who underwent abdominal surgery at Sri Ramakrishna Hospital, Coimbatore

SAMPLING TECHNIQUE

Non probability Purposive sampling (n=60)

SAMPLING SIZE:

60 samples who underwent abdominal surgery.

Criteria for Sample Selection

The purposive sampling method is employed to pick 60 patients. Patients were chosen for the study based on inclusion and exclusion criteria.

Inclusion criteria

- Patients with vertical incision in the abdomen.
- Patients with laparotomy.
- Patients with hysterectomy
- Patients who are alert and cooperative.
- Patients who can be ambulated after getting surgeon’s opinion.

Exclusion criteria

- Patients with Cesarean section.
- Patients who are critically ill
- Patients undergoing laparoscopic surgery

- Patients with orthopedic, neuromuscular and circulatory disorders.
- Epidural analgesics

DATA COLLECTION INSTRUMENT

Non- randomized quasi experimental post test only control group design was adopted. By using the purposive sampling technique 60 study participants were selected based on inclusion and exclusion criteria were assigned alternately so as to have 30 in experimental and 30 in control group. The intervention for the study was application of abdominal binder. Abdominal binder was applied for the patients on the first postopertative day onwards and continued in the experimental group and control group received routine nursing care. For the first three postoperttive days, ambulatory pain assessed using the Numerical Pain Rating Scale (NPRS) twice daily for both the experimental and controls groups.

DATA ANALYSIS AND INTERPRETATION

SECTION I

Demographic details of post-operative patients with abdominal surgery

(n =60)

S.No	in years	Number of patients			
		Experimental group (n=30)		Control group (n=30)	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Age					
1	18 - 30	4	13.3	3	10.0
2	31 - 40	5	16.7	6	20.0
3	41 - 50	11	36.7	6	20.0
4	51 - 60	7	23.3	7	23.3
5	Above 60	3	10.0	8	26.7
Gender					
1	Male	8	26.7	8	26.7
2	Female	22	73.3	22	73.3
Religious Status					
1	Hindu	25	83.3	21	70
2	Muslim	4	13.3	5	16.7
3	Christian	1	3.3	4	13.3
Dietary pattern					
1	Vegetarian	8	26.7	6	20
2	Non-Vegetarian	22	73.3	24	80

Educational status					
1	Illiterate	4	13.3	6	20.0
2	Primary	9	30.0	2	6.7
3	Secondary	11	36.7	11	36.7
4	Graduate and above	6	20.0	11	36.7
Occupation					
1	Government	3	10.0	1	3.3
2	Private	8	26.7	6	20.0
3	Business	3	10.0	2	6.7
4	Daily Wages	1	3.3	1	3.3
5	Unemployed	15	50.0	20	66.7
Marital Status					
1	Single	3	10	2	6.7
2	Married	21	70	21	70.0
3	Widow	6	20	4	13.3
4	Separated	-	-	3	10
Type of Family					
1	Joint	14	47	18	60
2	Nuclear	16	53	12	40
Family Monthly Income					
1	Less than 10000	1	3.3	-	-
2	10,001 to 20,000	3	10	2	6.7
3	20,001 to 30,000	5	16.7	4	13.3
4	30,000 above	21	70	24	80

SECTION II

CLINICAL VARIABLES	**No. of Patients**			
	Number of patients		**Number of patients**	
	Experimental group (n=30)	**Experimental group (n=30)**	**Control group (n=30)**	**Control group (n=30)**

Diagnosis	Abdominal blunt injury				
	Abdominal Pelvic	1	3.3	1	3.3
	Mass	1	3.3		
	Abnormal Uterine	5	16.6	4	13.3
	Bleeding	2	6.6	1	3.3
	Appendicitis	8	26..6	10	33.3
	Hernia	3	10	4	13.3
	Fibroid uterus	3	10	5	16.6
	Cancer in uterus	2	6.6	1	3.3
	Pancreatitis	4	13.3	2	6.6
	Cancer in abdomen			1	3.3
	Jejunal perforation			1	3.3
	Recurrent pyogenic cholangitis	1	3.3		
	Sigmoid diverticulitis				
Surgical Procedure	Emergency laparotomy	3	10	3	10
	Elective laparotomy	9	30	10	33.33
	Abdominal Hysterectomy	10	33.33	10	33.33
	Hernia repair	8	26.67	7	23.34
BodyTemperature(°F)	Hypothermia (<95)	-	-	-	-
	Normothermia(96-98.9)	23	76.7	21	70
	Hyperthermia(99-100)	7	23.3	9	30
Pulse Rate (beats per minute)	70-80	16	53.33	12	40
	80-90	12	40	16	53.33
	90-100	2	6.67	2	6.67
Respiratory Rate (breath per)	18- 22	25	83.3	21	70
	22 - 30	5	16.7	9	30
Blood Pressure (mm.hg) Systolic Blood Pressure	100-110	13	43.3	7	23.33
	111-120	3	10	10	33.33
	121-130	10	33.3	11	36.67
	131-140	2	6.6	1	33.33
	> 141	2	6.6	1	3.33
Blood Pressure Diastolic Blood Pressure	60-70	11	36.6	10	33.33
	71-80	13	43	17	56.67
	81-90	6	20	3	10

Body Mass Index	Underweight (18.5) Normal (18.5-24.5) Over weight (25.0-29.9) Obesity (Above30)	5 15 3 7	16.7 50 10 23.3	4 13 6 7	13.3 43.3 20 23.3
Co-morbid Illness	Yes No	15 15	50 50	17 13	56.67 43.33
Previous Surgery	Yes No	22 8	73.3 26.7	22 8	73.3 26.7
Duration of Surgery	Less than 3Hrs More than 3 Hrs	16 14	53.3 46.7	20 10	66.7 33
Anesthesia	General Spinal Both	17 8 5	56.7 26.7 16.7	11 6 13	36.7 20 43.3
Recovery from Anesthesi	≤ 3 Hours >3 Hours	12 18	40 60	18 12	60 40
Abdominal Girth	≤85cm >85cm	17 13	56.7 43.3	15 15	50 50
Length of Surgical Incis	Less than 15 cm More than 15 cm	16 14	53.3 46.7	17 13	56.7 43.3
Surgical Dressing	Grip Band Plaster Gauze Pad	21 9	70 30	21 9	70 30
Presence of Drain	No drain tube Romovac drain Romovac and pvc drain	8 7 15	26.7 23.3 50.0	10 8 12	33.3 26.7 40
Post Operative Diet	Empty Stomach Liquid Diet Bland Diet	13 15 2	43.3 50.0 6.7	10 8 12	33.3 26.7 40

Assessment on level of ambulatory pain among post operative patients with abdominal surgery n=60

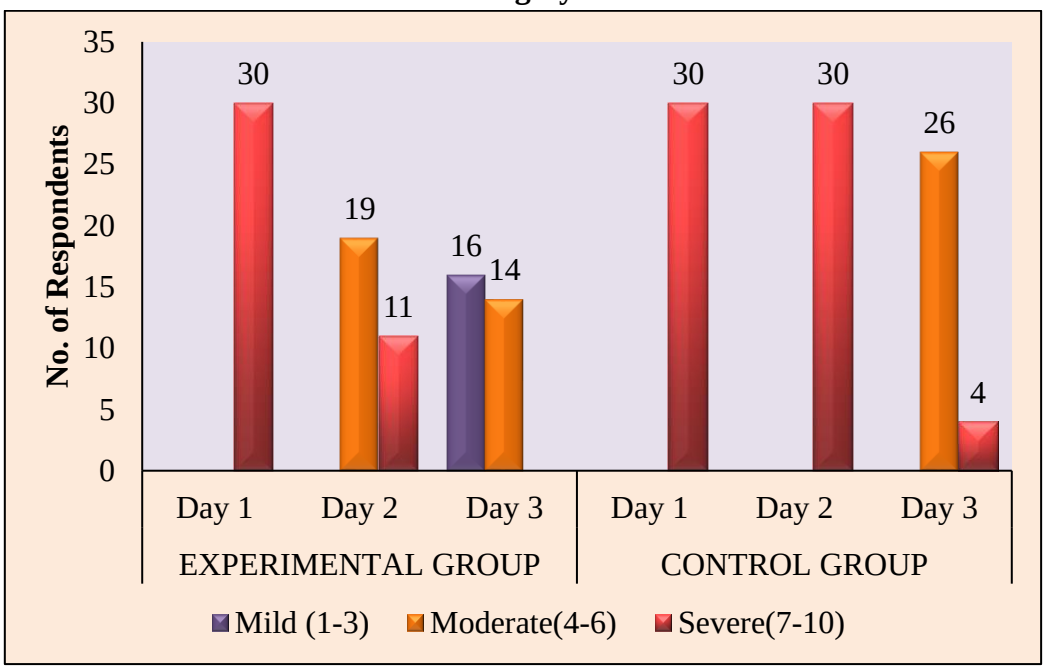
S. No	**LEVEL OF AMBULATORY PAIN**	**Number of Patients**					
		Experimental group (n=30)			**Control group (n=30)**		
		POD 1	**POD 2**	**POD 3**	**POD 1**	**POD2**	**POD 3**
		Frequency	**Frequency**	**Frequency**	**Frequency**	**Frequency**	**Frequency**

1	Mild (1-3)	-	-	16	-	-	-
2	Moderate (4-6)	-	19	14	-	-	26
3	Severe (7-10)	30	11	-	30	30	4

The above table 4.3.1.depicts the assessment on level of ambulatory pain among Post-Operative Patients with Abdominal surgery. The results showed that in the experimental and control group 30 (100%) patients had severe pain on the first postoperative day. On the second day, 19 (63.33%) patients had moderate pain and 11 (36.67%) patients had severe pain in the experimental group. On the other hand, 30 (100%) patients had severe pain in the control group.

On the third day, 16(53.3%) patients had mild pain, and 14 (46.67%) patients had moderate pain in the experimental group. On the other hand, 26 patients had moderate pain, and 4 (13.33%) patients had severe pain in the control group.

Chart- Assessment on level of ambulatory pain among post operative patients with abdominal surgery



Effect of abdominal binder on ambulatory pain among post operative patients with abdominal surgery in the experimental and control group

n=60

POD*	Group	Mean	SD	Mean difference	'z' Value	Table value
I	Experimental group	8.35	0.787	0.72	0.286	1.96

	Control group	9.07	0.435			
II	Experimental group	5.93	0.81	1.35	6.037	3.29***
	Control group	7.28	0.692			
III	Experimental group	3.28	0.663	1.9	3.653	3.29***
	Control group	5.18	0.748			

*-POD-Post Operative Day
***significant at 0.001 level

RESULTS AND DISCUSSION

The analysis showed that the mean level of pain among experimental and control group was 8.35 and 9.07 respectively with mean difference of 0.72. The calculated 'z' value 0.286 was less than table value of 1.96 at 0.05 level of significance. Hence, the hypothesis **H_1** is rejected there is no significant difference in the level of ambulatory pain among post operative patients with abdominal surgery in the experimental and control groups on the first post operative day**.**

The analysis showed that the mean level of pain among experimental and control group was 5.93 and 7.28 respectively with mean difference of 1.35. The calculated 'value 6.037 was greater than table value of 2.58 at 0.001% level of significance. Hence, hypothesis **H_1** is accepted, there is a highly significant difference in the level of ambulatory pain among post operative patients with abdominal surgery in the experimental and control groups on second post operative day.

CONCLUSION

Postoperative ambulatory pain is common for abdominal surgeries. The planned post-operative nursing care will reduces the ambulatory pain and improves the early ambulation. The abdominal binders help to reduces the post-operative ambulatory pain and preserves the hemodynamic stability. The study shows that application of abdominal binder on incisional site results in reduction of ambulatory pain during post-operative period. Hence it is concluded that the abdominal binder is an non - elastic, cost effective method in reducing the ambulatory pain among post operative patients.

REFERENCE

1. Sundeep, 2018, Unpublished dissertation, submitted to The Dr. M.G.R Medical University. Arici, E., Tastan, S., & Can, M. F. (2016). The effect of using an abdominal binder on postoperative gastrointestinal function, mobilization, pulmonary function, and pain in patients undergoing major abdominal surgery: A randomized controlled trial. *International journal of nursing studies*, *62*, 108–117. https://doi.org/10.1016/j.ijnurstu.2016.07.017
2. Bouvier A, Rat P, Drissi-Chbihi F, Bonnetain F, Lacaine F, Mariette C, Ortega-Deballon P. (2014) Pour La Federation de Recherche enChirurgie (FRENCH). Abdominal binders after laparotomy: review of the literature and French survey of policies. Hernia. 2014;18(4):501-6. doi: 10.1007/s10029-014-1264-2.
3. Chantawong, N., &Charoenkwan, K. (2021). Effect of Elastic Abdominal Binder on Pain and Functional Recovery Following Gynecologic Cancer Surgery: A Randomized Controlled Trial. Medicina, 57(5), 481.
4. Deepa, M.,(2018), A Study to assess the effectiveness of early Ambulation on Post Operative Recov-

ery of Patients who have undergone Abdominal Surgery at Railway Hospital, Perambur, Chennai, World Journal of Pharmaceutical and Medical Research, 4(11), 196-198.

5. Ghana, S., Hakimi, S., Mirghafourvand, M., Abbasalizadeh, F., & Behnampour, N. (2017). Randomized controlled trial of abdominal binders for postoperative pain, distress, and blood loss after cesarean delivery. International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics, 137(3), 271–276. https://doi.org/10.1002/ijgo.12134
6. Kaur, H., Kaur, S., & Sikka, P. (2015). A quasi-experimental study to assess the effectiveness of early ambulation in post-operative recovery among post-caesarean mothers admitted in selected areas of Nehru Hospital, PGIMER, Chandigarh. Nursing & Midwifery Research Journal, 11(1), 33-44.
7. Meenakshi, G. (2018). Effectiveness of early ambulation on post operative recovery among the women who has undergone abdominal hysterectomy at Government Rajaji Hospital, Madurai (Doctoral dissertation, College of Nursing, Madurai Medical College, Madurai).
8. Ossola, P., Mascioli, F., Coletta, D., Pizzato, M., & Bononi, M. (2021). Evidence on postoperative abdominal binding: A systematic review with meta-analysis of randomized controlled trials. The surgeon : journal of the Royal Colleges of Surgeons of Edinburgh and Ireland, 19(4), 244–251. https://doi.org/10.1016/j.surge.2020.07.003
9. Ragavan, M. P., Kalaimathi, S. A. G., Raja, A. A., & Babu, A. Effectiveness of Nursing Intervention Package on Improving Bone Health among Post Menopausal Women Residing In Rural Villages of Tiruvannamalai District, Tamilnadu Pilot Study Report.
10. Rothman, J. P., Gunnarsson, U., & Bisgaard, T. (1966). Abdominal binders may reduce pain and improve physical function after major abdominal surgery-a systematic review. database, 2013.
11. Saeed, S., Rage, K. A., Memon, A. S., Kazi, S., Samo, K. A., Shahid, S., & Ali, A. (2019). Use of abdominal binders after a major abdominal surgery: a randomized controlled trial. Cureus, 11(10).
12. VeerabhadramGarimella (2013). Postoperative pain control. Clinics in colon and rectal surgery, 26(03), 191-196.
13. Saramma, P. P., & Mathew, R. (2013). Assessment of post-operative pain and itsmanagement among patients undergoing craniotomy. Nursing Journal of India, 104(3), 101.
14. Dobson GP. Trauma of major surgery: A global problem that is not going away. Int J Surg. 2020 Sep;81:47-54. doi: 10.1016/j.ijsu.2020.07.017. Epub 2020 Jul 29. PMID: 32738546; PMCID: PMC7388795.
15. Boonploeng, K., Pratipanawatr, S., &Tangsiriwatthana, T. (2021). Abdominal Binder for Improving Postoperative Physical Function after Benign Gynecologic Surgery: A randomized controlled trial. Thai Journal of Obstetrics and Gynaecology, 10-16.