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Effectiveness Of Myotherapy On Pain Among Patients Subjected To Major Orthopaedic Surgery At A Tertiary Care Hospital

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ABSTRACT:

Introduction: Pain as a main social problem has involved millions of people. From the first seconds after birth human being experience pain caused by the very first action he does in this world, breathing. Nurses' fear of patient's addiction to drugs and drug's side effects. (Therefore reducing patients' pain is one of the main medical goals which is often executed by giving them narcotic drugs but these drugs usually have side effects that make them less effective. Myotherapy is a non medical treatment used for treating pain and stress. Aim The aim of the study were to determine the effectiveness of myotherapy on pain, identify the relationship among pain and associate the selected background variables with pain among patients subjected to major orthopaedic surgery.

Methods :The research design adopted for the study was randomized controlled trial. The study was conducted among 250 samples,125 in the study and 125 in control group to evaluate the effectiveness of myotherapy on post operative pain, ADL and stress among patients subjected to major orthopedic surgeries. The mean age of the study participants were male and female equally distributed. The investigator delivered myotherapy for the patients from the 1st post operative day to the 5th post operative day for 45 minutes in foot and hands and myotherapy was taught to patient's caregiver along with myotherapy manual issued to them to continue care at home from the day of discharge to 30th post operative day weekly thrice for three weeks. The control group received routine care from the hospital. Data were collected and analyzed using descriptive and inferential statistics

Findings:- Independent 't' test revealed that during pre and post assessment of pain in the study and the control groups from day 3 to day 5 was highly significant at p=0.001 level. A significant strong positive correlation between pretest stress and pain which was significant at p<0.001 and also strong positive correlation between posttest pain V and posttest stress which was significant at p<0.001. The RM ANOVA

results highlighted that there was a significant difference between the groups as well as within the group ($p<0.001$) on Pain, among the patients subjected to major orthopaedic surgery.

Conclusion :-The study result reveals that the orthopaedic surgical patients suffering with severe pain, stress, economically burdened and functional disability for long time. Myotherapy is one of the complementary medicine which has a great impact on the human body and this study suggested that the practice of myotherapy can decrease the pain and reduce dosage of painkiller and can improve the quality of life.

KEYWORDS: Post operative, pain, activities of daily living, stress and myotherapy.

INTRODUCTION: The maintenance of the physical health in the present world has become a challenging one because of various reasons. The common reasons of ill health are the change in the life style of an individual leading to non communicable diseases, changing societal norms leading to violence and terrorism and drastic climatic changes which in turn have led to the re-emergence of many diseases**.** Pain can affect the patient's physiological, psychological, social, mental functions and decrease the quality of life. The physiological effect is related to impaired respiration, disturbances in sleep and appetite and decreased mobility.

Post operative pain if not addressed at proper time or in proper manner the patient would be subjected to its adverse effect. Post operative pain can affect all organ systems and includes decreased respiratory vital capacity, increased myocardial oxygen consumption, reduced gut motility, urinary retention, reduced mobility, increased risk of deep vein thrombosis, anxiety and fatigue .

Approximately 25% of the individuals had undergone one or more surgical procedures during the three preceding years and 40% of them reported persistent pain in the area of surgery. Johansen et al., 2012 reported of moderate to severe pain by 18.3% of the patient's Breivik et al., 2006 pointed to severe pain associated with decreased patient satisfaction, delayed post operative ambulation, development of chronic post operative pain, an increased incidence of pulmonary and cardiac complications and increased morbidity and mortality (Popping et al. 2008)

The investigator conducted descriptive study to rule out the prevalence of acute post operative pain after general surgery among patients admitted in BIRRDS Hospital.(2014) The result revealed that a high percentage of severe postoperative pain was commonly observed during 1st to 5th post operative days. It is mostly treated only with pharmacological agents on prescribed timings which may have side effects and cost consuming.

Nurses caring for patients during the post-operative period find it challenging to their pain and stress. Although analgesic drugs are helpful in reducing pain, the adverse effects lead to further discomfort. Therefore, there is a need for nurses to have scientifically tested, simple and effective interventions to

manage pain and stress. A steady, emerging body of evidence suggests that myotherapy is vital to the healing process of patients undergoing general surgery. However, very little is known about their effectiveness in orthopaedic surgery patients. So, the researcher has chosen the study to propagate this intervention on a wide spread in all health care settings. This intervention is feasible and also can be done easily at any setting. All these above mentioned issues prompted the investigator to undertake The objective of this study was to evaluate the effectiveness of myotherapy on pain, ADL and stress among patients subjected to major orthopaedic surgery.

MATERIALS AND METHODS:

The experimental research design adopted was Randomized controlled trial. The 250 samples were selected based on the selection criteria. The investigator used randomization to have a control over the individual and extraneous variables and to secure good comparable groups. Block randomization was adopted using 5 blocks with 50 patients in each block. The patients were randomly assigned to the study and control groups based on the lottery method. The procedure was explained to them and written consent was obtained from them.

Group	Pretest	Intervention	Post test	
	1st Post-operative day	1st to 5th Post-operative day	I 5th post-operative day	II 12th post-operative day
Study	*O_1	X♣ @	♦ △	△
Control	*O_1	*♣	*	* ♦

Key:

R -Block Randomization of patients with major orthopedic surgeries to the study and the control group.

O1 - Pretest assessment of back ground variables

***** - Routine care including medications

X - Intervention - A series of steps performed by investigator over the predefined pressure points on the patient's foot and hands by applying direct pressure using the palm daily for five days. This is to stimulate the spinal points in order to reduce pain, stress and to improve the ADL.

♣ - Assessment of pain done before and after intervention

@ - Demonstration of myotherapy to the patients caregiver

△ - Return demonstration by the patients' caregiver

♦ - Issuing of myotherapy manual to the study group on 5th POD with performance checklist diaries attached at the end of the booklet and control group on 30th POD

The study was conducted at BIRRDS Hospital is a 1175 bedded multispecialty hospital. An average of 100- 150 patients were admitted with various orthopedic problems. On average 5-15 patients were posted every day. The sample consisted of major orthopedic surgical patients who fulfilled the sampling criteria during the study period. The investigator adopted randomization in assigning the samples to the study and control groups respectively until the determined sample size was obtained. The following patients were included in the study Male and female in the age group of 21- 60 years, patients who received either general/ spinal/ epidural anesthesia, who underwent surgery like open reduction internal fixation (femur, tibia, fibula), total knee replacement and total hip replacement, who completed 24 hours after surgery with irrespective of receiving analgesics and antibiotics during post-operative period and patients' caregivers who is willing to perform myotherapy for patients' and available during data collection period.

Section I Background variables:

The background variables includes demographic variables, clinical variables and surgical variables

A. Demographic variables of the patients were age, gender, educational status, occupation, monthly income, marital status, type of family and residency

B. Clinical variables of the patients were co morbid illnesses, edema, previous history of hospitalization, previous history of surgery and caregivers support.

C. Surgical variables of the patients were type of surgery type of anesthesia

Administration:

The background variables were answered by the subjects during data collection.

Numeric Pain Scale is a common self -report tool used to assess the pain intensity. It is a box scale, which consists of 11 numbers (0-10) presented in ascending order and surrounded by a box. Minimum score in Numeric Pain Intensity Scale was 0 and maximum score was 10.

The pain intensity was classified as following:-

0 - No pain

1-3 - Mild pain

4-6 - Moderate pain

7-10 - Severe pain

Intervention:

Independent variable myotherpy was used as an intervention for the patients in the study group who were subjected to major orthopedic surgeries. Myotherapy is series of steps of procedures performed by the investigator such as head spin, ankle slide, rotation massage, foot side twist, planter pressure, sole massage, dorsal press, groove press, top of foot crease side and closing over the predefined pressure points on the patient's foot (12 steps) and Finger massage, Finger stretch, Finger squeeze, Wrist massage both side and Wrist shake on hands (5 steps in each hand) by applying direct pressure in the palm during hospital stay, there after by the care giver who observed the demonstration This is to stimulate the spinal points in order to reduce pain.

The intervention intended to reduce the pain. Myotherapy was given from the first post-operative day (POD) to the fifth post- operative day to the study group by the investigator in front of the patient's caregivers. Myotherapy was demonstrated on the 5th postoperative day to the patients' caregiver with an appropriate illustration and demonstration. Re-demonstration was done on 6th to 12th POD in front of the investigator, skill was assessed with the checklist which was prepared by the investigator. Pain was assessed daily, 15 minutes before and after the myotherapy. Handbook on myotherapy in Tamil /English and assessment diary were handed over to the patients' caregiver on the 5th POD to carry out the myotherapy at hospital daily till 12th POD and at home weekly thrice for three weeks. The handbook covered literature regarding preparation for myotherapy, steps of myotherapy. Twice weekly direct and telephonic reinforcement were given. On the first post-operative follow-up the patients' caregivers were instructed to continue myotherapy if needed

RESULTS:

Table 2: Frequency and percentage distribution of socio demographic variables among patient subjected to major orthopaedic surgery in study and the control groups (N= 250)

Demographic Variables	**Study Group (n=125)**		**Control Group (n=125)**		χ^2	**p value**
	No.	**%**	**No.**	**%**		
Age (in years)						
21-30	38	30.4	35	28.0		.767
31-40	17	13.6	19	15.2	0.143	(NS)
41-50	27	21.6	33	26.4		
51-60	43	34.4	38	30.4		
Gender						.759
Male	99	79.2	97	77.6	0.094	(NS)
Female	26	20.8	28	22.4		
Educational qualification						
Post Graduate	8	6.4	2	1.6		.08
Graduate	18	14.4	14	11.2	9.75	(NS)
Higher Secondary	23	18.4	25	20.0		
High School	28	22.4	31	24.8		
Primary	19	15.2	33	26.4		
No formal education	29	23.2	20	16.0		
Occupation						
Employed	15	12	20	16		.55
Self employed	25	20	30	24	3.99	(NS)
Unemployed	13	10.4	7	5.6		
Daily wages	41	32.8	44	35.2		
House wife	25	20	22	17.6		
Agriculture	6	4.8	2	1.6		
Family monthly income(Rs)						
Rs.<2500	57	45.6	53	42.4	0.935	.816
Rs.2501 – 5000	40	32.0	42	33.6		(NS)
Rs.5001 – 7500	17	13.6	15	12		
Rs.>5001	11	8.8	15	12		
Type of Family						
Nuclear	64	51.2	62	49.6	0.064	.800
Joint	61	48.8	63	50.4		(NS)
Marital status						
Married	87	69.6	89	71.2		.283
Unmarried	32	25.6	31	24.8	5.039	(NS)
Widow	5	4.0	1	0.8		
Widower	1	8	2	1.6		
Separated	-	-	2	1.6		
Residency						
Urban	62	49.6	60	48	0.064	.800
Rural	63	50.4	65	52		(NS)

Table 3 Frequency, percentage and chi square distribution of clinical variables among patients in the study and the control groups (N= 250):-

Clinical Variables	Study Group (n=125)		Control Group (n=125)		$\square^2$	p value
	No.	%	No.	%		
Co-morbid illnesses						
DM	20	16.0	23	18.4		.032*
HT	11	8.8	13	10.4	10.541	
DM,HT	5	4.0	18	14.4		
Asthma	1	0.8	-	-		
None	88	70.0	71	56.8		
Edema						
Present	85	68.0	92	73.6	0.948	.330
Absent	40	32.0	33	26.4		(NS)
Previous history of hospitalization						
No	71	56.8	70	56.0	0.016	.899
Yes	54	43.2	55	44.0		(NS)
Previous history of surgery						
No	76	60.8	84	67.2	1.111	.292
Yes	49	39.2	41	32.8		(NS)
Caregivers support						
Spouse	50	40.0	50	40.0	4.644	.326
Children	27	21.6	40	32.0		(NS)
Parents	30	24.0	22	17.6		
Friends	12	9.6	8	6.4		
Others	6	4.8	5	4.0		
Type of surgery						
THR	30	24.0	31	24.8		.966
TKR	23	18.4	21	16.8	0.264	(NS)
ORIF- femur	44	35.2	43	34.4		
ORIF-Both bone	28	224	30	24		
Type of anesthesia						
Spinal	109	87.2	110	88.0		.848
General	16	12.8	15	12.0	0.037	(NS)

Table-4 Comparison of level of pain among patients in the study group and the control groups during day 1 to5 (N=250)

Level of Pain	Pretest				Posttest			
	Study group (n=125)		Control group (n=125)		Study group (n=125)		Control group (n=125)	
	No.	%	No.	%	No.	%	No.	%
Day 1								
No pain	-	-	-	-	-	-	-	-
Mild	-	-	-	-	2	1.6	7	5.6
Moderate	8	6.4	7	5.6	90	72	20	16.0
Severe	117	93.6	118	94.4	33	26.4	98	78.4
χ^2 & p value	**0 .071& .790 NS**				**79.575& .000*** **			
Day 2								
No pain	-	-	-	-	-	-	-	-
Mild	-	-	-	-	3	2.4	13	14.4
Moderate	32	25.6	15	12.0	110	88.0	66	52.8
Severe	93	74.4	110	88.0	12	9.6	41	32.8
χ^2 & p value	**7.573& .006****				**37.582& .000*** **			
Day 3								
No pain	-	-	-	-	-	-	-	-
Mild	5	4.0	21	16.8	100	80.0	35	28.0
Moderate	92	73.6	79	63.2	17	13.6	69	55.2
Sever	28	22.4	25	20.0	8	6.4	21	16.8
χ^2 & p value	**11.004& . 004****				**68.566 & .000*** **			
Day 4								
No pain	10	8.0	5	4.0	47	37.6	11	8.8
Mild	53	42.4	30	24.0	57	45.6	40	32.0
Moderate	60	48.0	85	68.o	19	15.2	69	55.2
Sever	2	1.6	5	4.0	1	1.6	5	4.0
χ^2 & p value								
Day 5								
No pain	44	35.2	22	17.6	100	80.0	63	50.4
Mild	34	27.2	42	33.6	18	14.4	34	27.2
Moderate	47	37.6	61	48.8	7	5.6	28	22.4
Sever	-	-	-	-	-	-	-	-
χ^2 & p value	**9.990 & 0 .007****				**26.433 & .000*** **			

Table 5 Comparison of day 1 to 5 mean score of pain among patients in the study group (n=125)

Duration of study	Mean	SD	Mean Difference	Paired t value p-value
Day 1 Pretest Posttest	 7.39 6.09	 .739 0.730	1.32	20.881 & .000***
Day 2 Pretest Posttest	 7.10 4.98	 0.974 1.136	2.12	15.853 & .000***
Day 3 Pretest Posttest	 5.18 1.72	 1.199 1.25	2.04	16.515 & .000***
Day 4 Pretest Posttest	 3.23 1.38	 2.005 1.712	1.84	14.157 & .000***
Day 5 Pretest Posttest	 1.84 0.51	 1.775 1.11	1.30	9.889& .000***

Table 6 Comparison of day 1 to 5 mean score of pain among patients in the control group (n=125)

Duration of study	Mean	SD	Mean Difference	Paired t value p-value
Day 1 Pre assessment Post assessment	 7.62 6.98	 0.82 1.53	0.10	4.36 .000***
Day 2 Pre assessment Post assessment	 7.47 5.56	 0.84 1.75	1.91	10.359 .000***
Day 3 Pre assessment Post assessment	 4.99 4.27	 1.74 1.78	0.72	9.599 .000***
Day 4 Pre assessment Post assessment	 4.02 3.41	 1.76 1.91	0.60	6.49 .000***
Day 5 Pre assessment Post assessment	 2.55 1.50	 1.86 1.87	0.64	8.193 .000***

Table 7 The comparison of overall level of pain among patients in the study group and the control groups during day 1 to 5 (N=250)

Level of Pain	Pre test				Post test			
	Study group (n=125)		Control group (n=125)		Study group (n=125)		Control group (n=125)	
	No.	%	No.	%	No.	%	No.	%
Day 1								
No pain	-	-	-	-	-	-	-	-
Pain	125	100	125	100	125	100	125	100
Day 2								
No pain	-	-	-	-	-	-	-	-
Pain	125	100	125	100	125	100	125	100
Day 3								
No pain	-	-	-	-	-	-	-	-
Pain	125	100	125	100	125	100	125	100
Day 4								
No pain	10	8.0	5	4.0	47	37.6	11	8.8
Pain	115	92	120	96	78	62.4	114	91.2
χ^2 & p value	**1.773& .183**				**29.094& .000*** **			
Day 5								
No pain	44	35.2	22	17.6	100	80.0	62	49.6
Pain	81	64	103	82.4	25	25.0	63	50.4
χ^2 & p value	**9.963& .001****				**25.3227 & .000*** **			

Table 8 Comparison of day 1to 5 mean difference scores of pain among patients between the study group and the control groups (N=250)

Duration of Study	Study group (n= 125)	Control group (n=125)	Independent t and p-value
	MD	MD	
Day1 Pre assessment Post assessment	1.32	0. 10	 1.50 1.33
Day2 Pre assessment Post assessment	2.12	1.91	 0.913 .362
Day3 Pre assessment Post assessment	2.04	0.72	 9.15 .000***
Day4 Pre assessment Post assessment	1.84	0.60	 7.72 .000***
Day5 Pre assessment Post assessment	1.30	0.64	 4.16 .000***

DISCUSSION:

Patients subjected to major orthopaedic surgery such as TKR, THR, ORIF in femur, fibula and tibia were selected as a participants for the study. Majority of the background variables were not having any significant difference between the study and the control groups except comorbids conditions, it may be due to randomization done to allot the samples. However, it shows homogeneity in samples and it helped to compare the outcome variables.

Table 4 shows that comparison of level of pain among patients in the study group and the control groups during day 1 to5 (N=250) was during day 1 117 (93.6%) in the study group and 118(94.4%) in the control group had severe pain. 8(6.4%) in the study 7 (5.6%) in the control group had moderate level of pain. None of them were reported mild and no pain during pretest. The p value indicates the homogeneity between the group. Posttest shows majority of the study group sample 90(72%) reported moderate pain in the study group whereas in the control group 98 (78.4%) of them reported severe pain. On day 2 in the study group 32(25.6%) and 15(12.0%) in the control group samples reported moderate pain. Majority of the samples, 93(74.4%) in the study and 110(88.0%) in the control group reported severe pain during pre interventional assessment were as in post interventional assessment 12(9.6%) in the study group and 41(32.8%) in the control group had severe pain. On day 3, none of them in the study group and in the control group reported no pain in pre and post test .On the same day none of them in the study group 5(4.0%) in the study group and 21(16.8%) in the control group reported mild pain during pre interventional assessment whereas during post interventional assessment in the study group100(80.0%) and 35(28.0%) in the control group reported mild pain. 92(73.6%) in the study group and 79(63.2%) in the control group reported moderate pain during pre interventional assessment whereas during post interventional assessment in the study group17(13.6%) and 69(50.2%) in the control group reported moderate pain. 28(22.4%) in the study group and 25(20.0%) in the control group reported severe pain during pre interventional assessment where as during post interventional assessment in the study group 8 (6.4%) and 21(16.8%) in the control group reported severe pain. On day 4 majority of the samples, 60(48.0%) in the study group 85(68.0%) in the control group reported moderate level of pain during pre interventional assessment whereas in the post interventional assessment 19(15.2%) in the study and 69(55.2%) in the control group reported moderate level of pain. On

day 5 44(35.2%) in the study and 22(17.6%) in the control group reported no pain during pre interventional assessment whereas in post interventional assessment 100(80.0%) in the study and 63(50.4%) in the control group reported no pain. Regarding mild pain 34(27.2%) in the study 42(33.6%) in the control group were reported mild pain during pre interventional assessment whereas during post interventional assessment 18(14.4%) in the study group and 34(27%) in the control group reported mild pain. Regarding moderate pain 47(37.6%) in the study group 61(48.8%) in the control group reported moderate pain during pre interventional assessment whereas during post interventional assessment 7(5.6%) in the study group and 28(22.4%) in the control group reported moderate pain.

Table 5 reveals that the pain mean score during the day 1 to day 5 among the study group shows that on day 1 the mean score of pain during pretest was 7.39 with SD of .739 and during posttest the mean score of pain was reduced. It was 6.09 with SD of 0.730. The MD score was 1.32.It was significant at p<.001 level. On day 2 the mean score of pain during pretest was 7.10 with SD of 0.974 and posttest was 4.98 with SD of 1.136. The MD score was 2.120 and it was significant at p<.000 level. On day 3, the mean score of pain during pre and post test was 5.18 and 1.72 with SD of 1.19 and 1.25. The MD score was 2.040 and it was significant at p<.001 level. On day 4, the mean score of pain during pre and posttest was 3.23 and 1.38 with SD of 2.005 and 1.71. The MD score was 1.84 and it was significant at p<.001 level. On day 5, the mean score of pain during pre and posttest was 1.84 and 0.51 with SD of 1.77 and 1.11. The MD score was 1.30 and it was significant at p< .001 level.

Table 6 shows that the mean difference found between the pretest and posttest from day1 to day5 in the control group was On day 1 The mean score of pain during pretest was 7.62 with SD of 0.82. During posttest the mean score of pain was reduced. It was 6.98 with SD of 1.53. The MD score was 0.10.It was significant at p<.001 level. On day 2 The mean score of pain during pre and posttest was 7.47 and 5.56 with SD of 0.84 and 1.75. The MD score was 1.91 and it was significant at p<.001 level. On day 3 The mean score of pain during pre and posttest was 4.99 and 4.27 with SD of 1.74 and 1.86.The MD score was 0.72 and it was significant at p<.001 level. On day 4 The mean score of pain during pre and posttest was 4.02 and 3.41 with SD of 1.76 and 1.91. The MD score was 0.60 and it was significant at p<.001 level. On day 5 The mean score of pain during pre and posttest was 2.55 and 1.50 with SD of 1.86 and 1.87. The MD score was 0.64 and it was significant at p<.001 level.

Table 8 reveals that the mean difference between pretest and post test in the study and the control group from day 1 to day 5. The mean difference score of pain during day one SG: CG 1. 32 :0.01 On day two 2.12 ;1.91. On 3rd day 2.04: 0.72. On 4th day 1.84: 0.60. On 5th day 1. 30: 0.64. The mean difference score was higher in the study group than in the control group.

The t and p value of pain score in the study and control groups showed that there were highly significant changes found within the study group on day 3 to day 5 days. It was significant at p<.001 level. These

findings strongly supported the hypothesis "There will be a significant change in level of pain of patients who receive myotherapy than those who do not. Hence H1 hypothesis was accepted.

These findings were strongly supported by the study of Ms. Chithra and Mrs. D' Almeida Sandhya (11) assessed the effectiveness of hand and foot massage on pain among women who have undergone abdominal hysterectomy in selected hospitals of Mangalore. A quasi experimental research approach was adopted. Interrupted time series design and Non probability purposive sampling was selected for the study. ANOVA values showed that the calculated F value using SFMPQ in the experimental group was 20.73, average pain intensity scale was 18.92, current pain intensity scale was 17.70[F(3,76)= 2.68; p¼ 0.05]. Unpaired 't' test values showed that the calculated t value in both the experimental and the control group by using SFMPQ in posttest 1 was 2.503, post test 2 was 2.259 and posttest 3 was 2.258; using an average pain intensity scale in posttest 1 was 2.608, posttest 2 was 2.949 and posttest 3 was 3.815; using current pain intensity scale in posttest 1 was 2.177, posttest 2 was 2.476 and posttest 3 was 2.131[t(39)= 1.960, p¼ 0.05 respectively. The study concluded that there was a significant reduction on pain among women who have undergone abdominal hysterectomy in the experimental group than the control group. In the present study table 11 highlighted a statistically significant difference in the mean difference scores during the post test III, IV and V and it was statistically significant at p<.001.

CONCLUSION:

The study result reveals that the orthopedic surgical patients suffering with severe pain, stress, economically burdened and functional disability for long time. Myotherapy is one of the complementary medicine which has a great impact on the human body and this study suggested that the practice of myotherapy can decrease the pain, stress, reduce dosage of painkiller and can improve the quality of life. The myotherapy is to be considered a noninvasive, cost effective intervention, positively influencing therapy and contributing to the reduction of pain, stress and improvement of quality of life in patients following orthopedic surgery.

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