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Effect of core stabilization training in improving the quality of health-related life in lumbar surgery patients

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ABSTRACT

Lumbar Spinal Surgery is one of the most common types of surgeries performed in the United States with over 500,000 surgeries performed for lumbar herniated disks and lumbar spinal stenosis in 2004. Numerous studies have reported the clinical outcomes of spinal surgery. All the subjects will complete a detailed assessment. Subjects, who will fulfil the selection criteria, will be informed about the study and requested to sign consent forms. Subjects' referred will be divided into 2 Groups by asking them to pick up chits from a box which is written as Group A or Group B. Each Group will consist of 15 patients. Group A control 1 group did myofascial release and Group B experimental. Descriptive statistics were used for outcome variable, SF 36 Questionnaire, MMT and VAS which was not statistically significant (p>.567) outcome variables measurement group. Both Group A and Group B significantly improved in all outcomes. But when compared both Group A and Group B result did not show any significant results. Both are same effective. Core stabilization training will improve the quality of health and reduce pain and improve strength in low back surgery patients.

Keywords: Core stability exercises, VAS, Numeric pain rating scale, Manual muscle testing, SF 36 Quality of health-related life scale

INTRODUCTION

The lower back or lumbar area serves a number of important functions for the human body. These functions include structural support, movement and protection of certain body tissues [1]. When we stand, the lower back is functioning the support the weight of the upper body. When we bend, extent, or rotate at the waist, the lower back is involved in the movement. Therefore, injury to the structures involved for weight bearing such as bony spine, muscle, tendons and ligaments can be detected. Spinal surgery is one of the most common types of surgeries performed in the United States with over 500,000 surgeries performed for lumbar herniated disks and lumbar spinal stenosis in 2004 [2]. Numerous studies have reported the clinical

outcomes of spinal surgery. However, many studies have defined success rates in terms of medically-related outcomes, such as fusion rates and radiographic evidence, rather than the patient's perspective. Studies have demonstrated that patient's perspective of their clinical outcomes are not necessarily the same as those of their clinicians. The reasons some people have persistent pain after surgery remain unclear, although result of recent studies indicate that micro discectomy is less successful for protruding discs than for extruded or sequestrated discs [3-5]. Other investigators have shown that a long duration of work incapacity before surgery is significantly associated with a poor outcome. This could reflect the negative consequences of a longer period of nerve root compression. Dynamic lumbar stabilization exercises are important in both the conservative treatment of lumbar disc herniation and in post-operative rehabilitation programs [6-10]. These exercises are done in the so-called neutral position where the segmental forces between disc and facet joints are best balanced and the most effective stability is obtained in axial tension strength. The neutral position is conserved during exercises and lumbar stability is not disturbed even in motion. While muscle strength is increased, improper tension is avoided in these exercises [11-15].

METHODOLOGY

This study is an experimental design involving the comparative analysis of pre and post-test values of parameters studied between two groups treated with Group_ A general exercises and Group _ B Lumbar stabilization exercises. Study was done on 30 subjects who will full fill the inclusion and exclusion criteria in general population. All the patients were recruited from the impatient and outpatient department K.T.G. Hospital, Bangalore, Sri Chandanamal Bothra Charitable Medical Hospital, Bangalore [16-18]. As these studies involve human subjects the ethical Clearance has been obtained from the ethical committee of KTG College of Physiotherapy, Bangalore as per the ethical guidelines for bio-medical research on human subjects, 2000 ICMR, New Delhi. Individually informed consent was taken from all the 30 subjects selected for the study on the basic of inclusion & exclusion criteria. The subjects divided into two groups i.e., Group-A and Group-B. Each group consists of 15 subjects. Pre-participation evaluation form consists of numerical pain rating scale of health-related quality of life scale with the help of we can measuring the patient quality of life [19, 20].

Group A (Control group)

The subjects will receive the post-operative exercises for low back surgery. The soft tissue flexibility and Range of motion of exercises.

Group B (Experimental group)

Dynamic lumbar stabilization exercises will be administered to the patients. Before the exercise program, the soft tissue flexibility and range of motion of these patients will be increased through stretching exercises, with 5–10minute relaxation periods. The exercise program will be performed 3 days a week with 5 repetitions in 3 sets to begin with and repetitions were gradually increased until they reached 15. Exercises will be conducted under the supervision of a physiotherapist who instruct the patients initially on an individual basis. They initially performed the exercises individually as well. After the basic steps had been covered successfully, patient's carryout the exercises in groups of 2 or 3 for the duration of the program. During the exercises the importance of neutral spinal position will be repeatedly stressed. The entire program last 8 weeks. The core stabilization exercises are i.e. medicinal ball exercises: sit up and throw, sit and twist pass, 45 degree sit, catch and pass, one leg twist pass, side touches down, kneeling twist pass. Static floor exercises: plank, side plank, bridge, superman. Dynamic floor exercises: side lying hip abduction, straight leg raising, lying wind screen wipe, oblique crunch.

Outcome measures

VAS, Numeric pain rating scale (0-10 cm, horizontal) for pain, Manual muscle testing, SF 36 Quality of health-related life scale

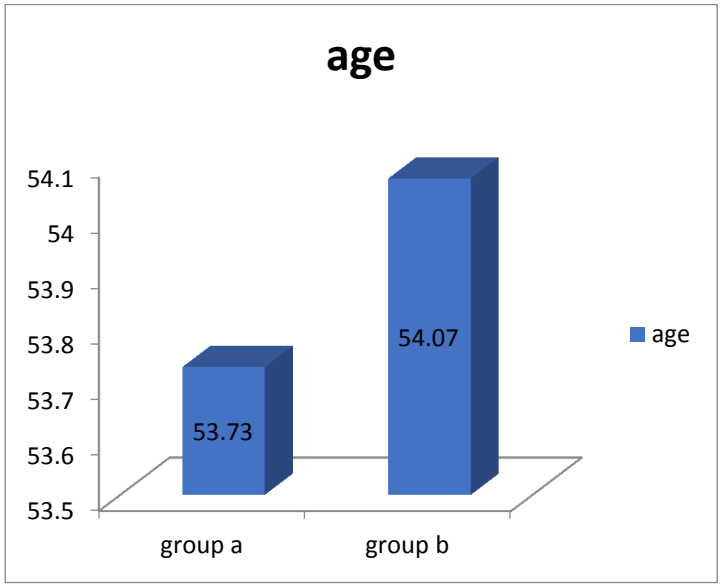
Data analysis

Statistical analysis will be performed by using SPSS software (windows version 16) and P-value will be set as 0.05. Simple t-test was used to find the significant between the groups. Descriptive statistics were used to analyze the baseline data for demographic and outcome data. Chi-square test was used to find out gender distribution among both the groups. Wilcoxon test was used within group. Mann-Whitney test used between groups. Unpaired test for age. Microsoft word, excel was used to generate graph and tables etc.

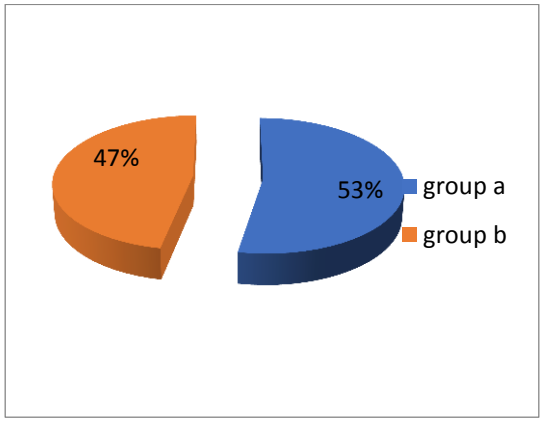
RESULTS

Table I: Baseline data for demographic variable

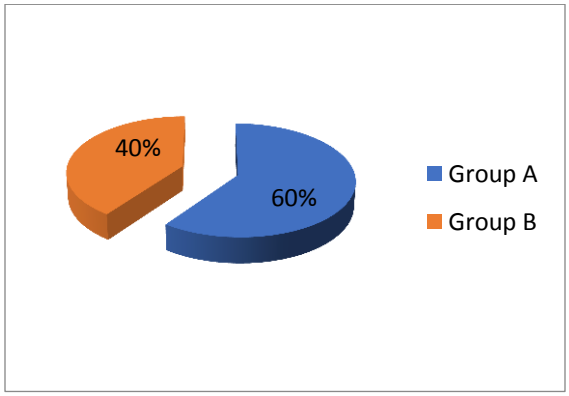
Sl. No:	Variable	Group A	Group B	p-value
1	Age	53.73±6.20	54.07±6.23	>0.884
2	Gender	8/7	9/6	>0.713



Graph 1: Mean age among both groups



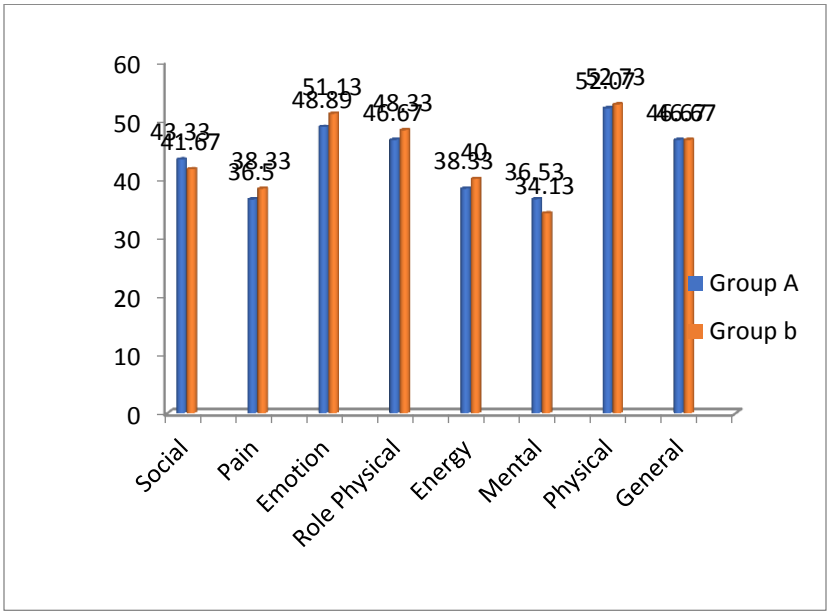
Graph 2: Gender distribution in Group A



Graph 3: Gender distribution in Group

Table II: Baseline data for outcome variable –SF 36

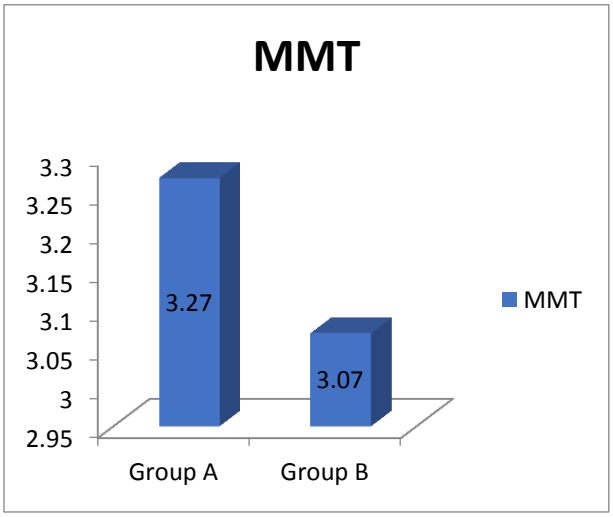
Sl. No:	Variable	Group A	Group b	p-value
1	Social	43.33±27.49	41.67±26.16	>0.870
2	Pain	36.50±12.13	38.33±11.37	>0.567
3	Emotion	48.89±21.36	51.13±24.79	>0.683
4	Role Physical	46.67±22.89	48.33±19.97	>0.838
5	Energy	38.33±9.00	40.00±7.56	>0.683
6	Mental	36.53±3.66	34.13±4.24	>0.714
7	Physical	52.07±9.00	52.73±8.35	>0.870
8	General	46.67±7.48	46.67±6.99	>0.967



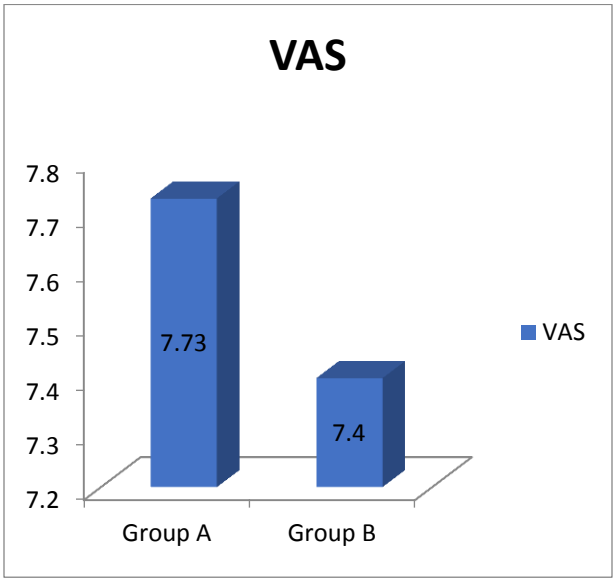
Graph 4: Means SF-36 among both groups

Table III: Baseline data for outcome variable (VAS & MMT)

Sl. No:	Variable	Group A	Group B	p-value
1	MMT	3.27±0.59	3.07±0.70	>0.486
2	VAS	7.73±1.03	7.40±0.91	>0.389



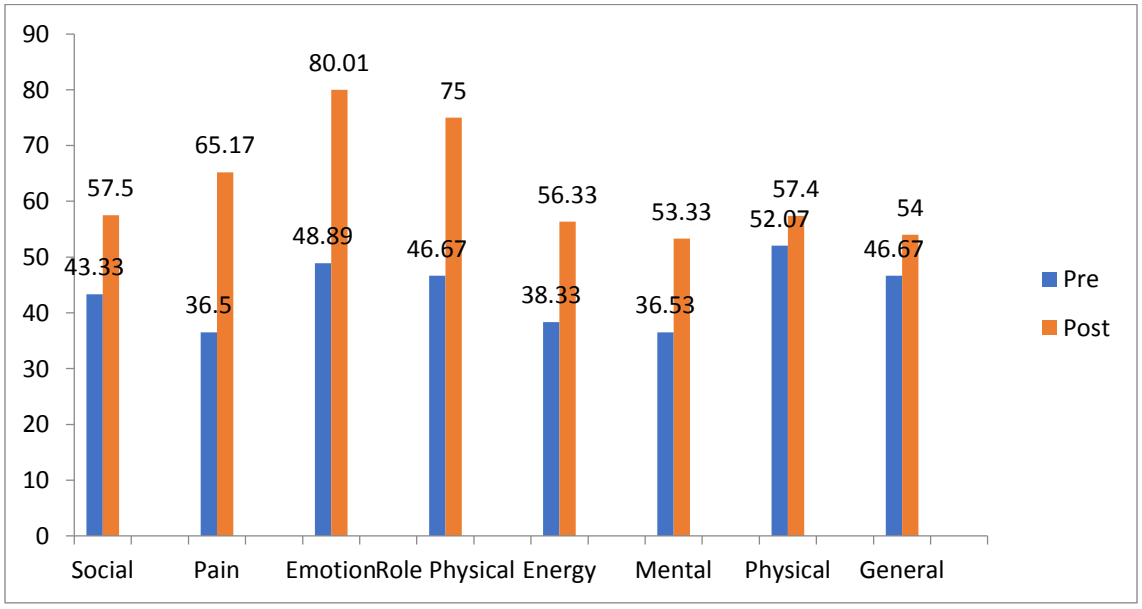
Graph 5: Mean MMT among both groups



Graph 6: Mean VAS score among both Groups

Table IV: Pre-post difference for SF 36 for group A

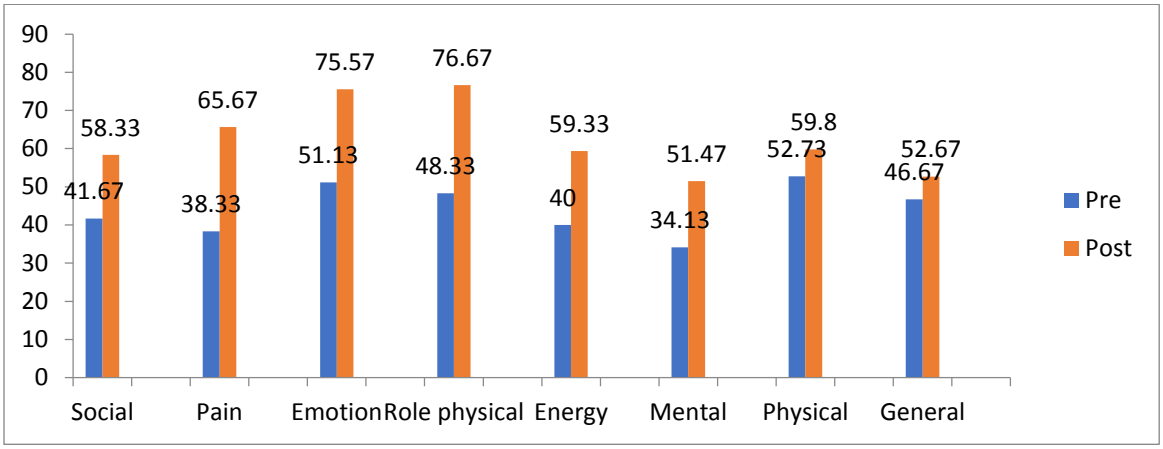
Sl. No:	Variable	Pre	Post	p-value
1	Social	43.33±27.49	57.50±16.23	<0.044
2	Pain	36.50±12.13	65.17±14.98	<0.001
3	Emotion	48.89±21.36	80.01±16.89	<0.002
4	Role Physical	46.67±22.89	75.00±18.90	<0.001
5	Energy	38.33±9.00	56.33±10.93	<0.001
6	Mental	36.53±3.66	53.33±6.17	<0.001
7	Physical	52.07±9.00	57.40±12.24	<0.038
8	General	46.67±7.48	54.00±12.42	<0.004



Graph 7: pre post difference with in group A

Table V: pre-post difference for SF 36 for Group B

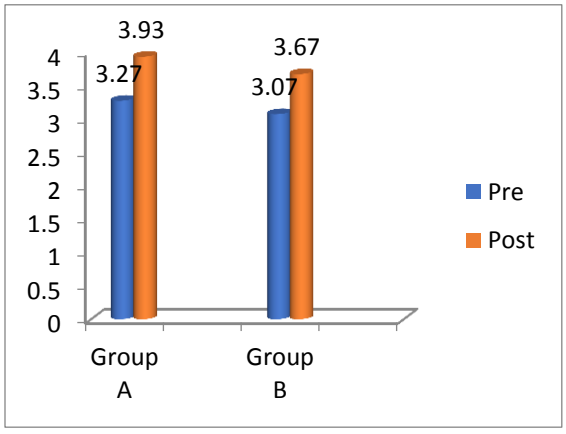
Sl. No:	Variable	Pre	Post	p-value
1	Social	41.67±26.16	58.33±19.23	<0.013
2	Pain	38.33±11.37	65.67±14.00	<0.001
3	Emotion	51.13±24.79	75.57±15.25	<0.016
4	Role physical	48.33±19.97	76.67±14.84	<0.004
5	Energy	40.00±7.56	59.33±9.80	<0.001
6	Mental	34.13±4.24	51.47±4.98	<0.001
7	Physical	52.73±8.35	59.80±9.86	<0.041
8	General	46.67±6.99	52.67±9.61	<0.021



Graph 8: pre post difference with in group B

Table VI: pre-post difference within groups for MMT

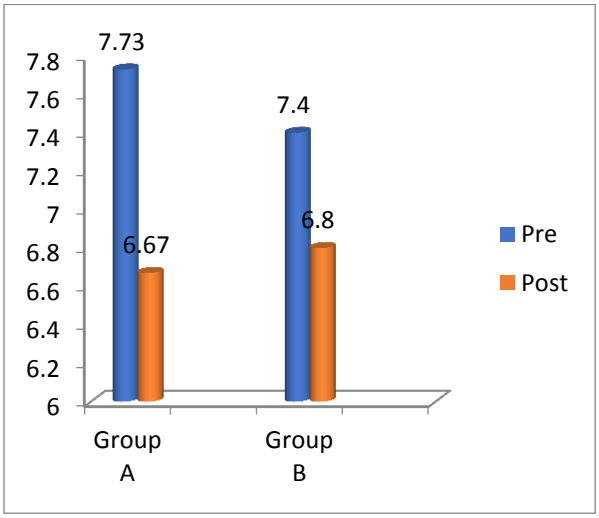
Sl. No:	Group	Pre	Post	P-value
1	Group A	3.27±0.59	3.93±0.25	<0.002
2	Group B	3.07±0.70	3.67±0.49	<0.003



Graph 9: pre post difference with in group for MMT

Table VII: pre-post difference within groups for vas

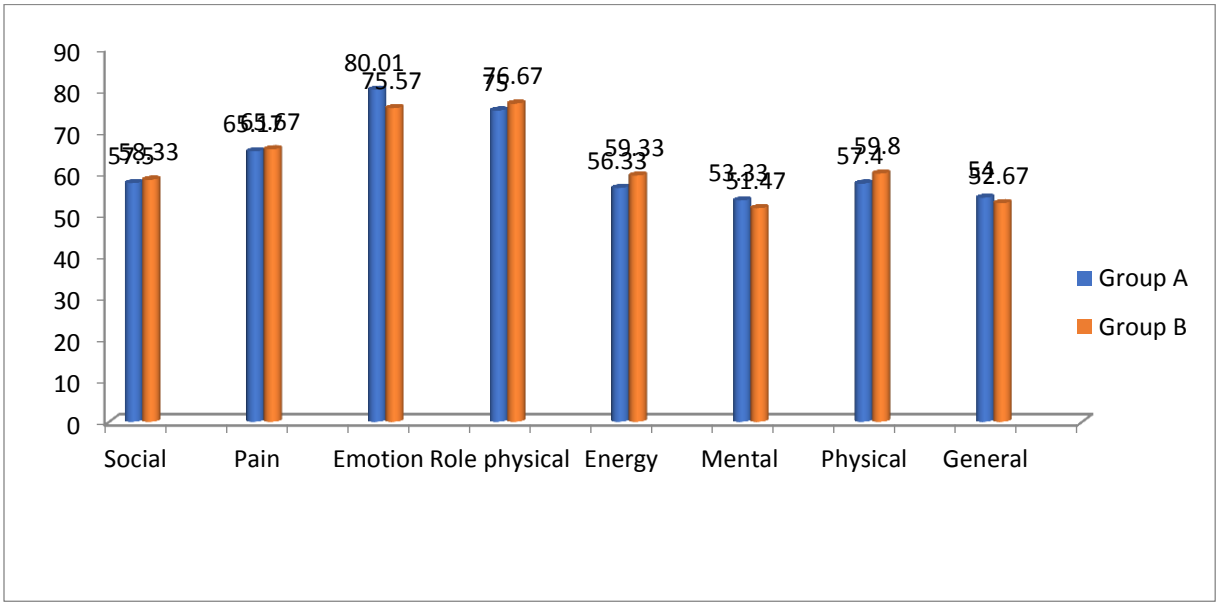
Sl. No:	Group	Pre	Post	P-value
1	Group A	7.73±1.03	6.67±0.82	<0.001
2	Group B	7.40±0.91	6.80±0.94	<0.014



Graph 10: pre post difference within group for VAS

Table VIII: Difference between Group – SF 36

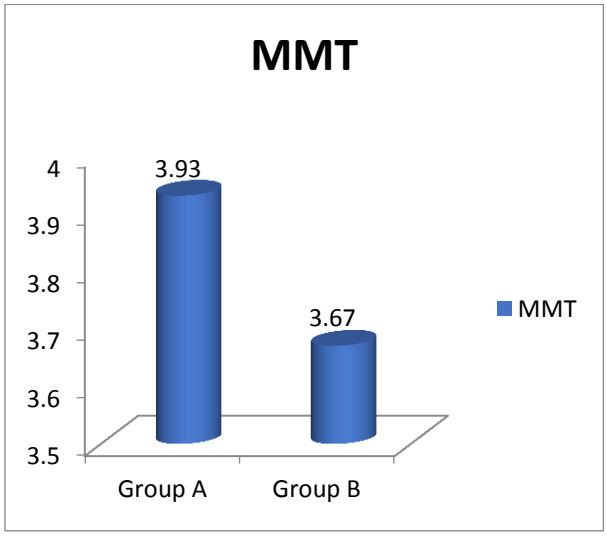
Sl. No:	Variable	Group A	Group B	p-value
1	Social	57.50±16.23	58.33±19.23	=1
2	Pain	65.17±14.98	65.67±14.00	>0.806
3	Emotion	80.01±16.89	75.57±15.25	>0.567
4	Role physical	75.00±18.90	76.67±14.84	>0.838
5	Energy	56.33±10.93	59.33±9.80	>0.512
6	Mental	53.33±6.17	51.47±4.98	>0.436
7	Physical	57.40±12.24	59.80±9.86	>0.539
8	General	54.00±12.42	52.67±9.61	>0.902



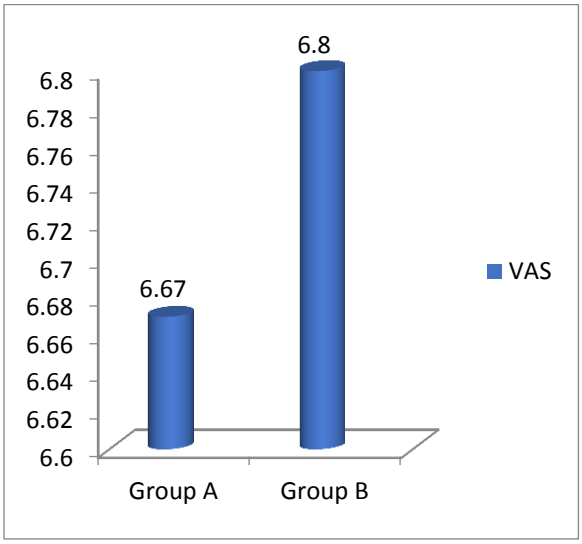
Graph 11: difference between group for SF-36

Table IX: Difference between Groups for MMT & VAS

Sl. No:	Variable	Group A	Group B	p-value
1	MMT	3.93±0.25	3.67±0.49	>0.217
2	VAS	6.67±0.82	6.80±0.94	>0.806



Graph 12: difference between group for MMT



Graph 13: Difference between Group for VAS

DISCUSSION

Purpose of this study was to determine the effect of the core stabilization training in improving the quality of health-related life in low back surgery patients. The baseline data of the demographic and outcome variables did not show any statistically significant difference between the patient populations in both groups, all patients in the both groups were able to complete the study. Descriptive statistics were used for outcome variable, SF 36, VAS and MMT which was not statistically significant ($p>0.567$) outcome variables measurement were homogeneous between groups before the study.

Result did not show any statistically significant difference in comparing both groups and Group A SF 36 and However when comparing between groups. The mean MMT score for Group A was 3.93 and in the Group B score was 3.67 which was not statistically significant (p value more than .217). For Group A the mean VAS score was 6.67 and in the Group B mean score was 6.80 which was not statistically significant (p value greater than 0.806). In summary both Group A group and Group B group are equally effective in improving MMT score and VAS INDEX. This statistical insignificant could be due to quality of life assessment by using SF 36 in that some domains assessed not related to make any significant result in this study outcome, so that would have influenced for this change. Physical exercise appears to have a beneficial effect on healing tissue as tension exerted on the wound is thought to

stimulate collagen synthesis and ensure that collagen is laid down in an organized manner parallel to the direction of forces. So, both the stability exercises and general strengthening and stretching is having effect after spinal surgeries.

So, this study accepting research hypothesis there is significant effect on core stabilization training in improving the quality of health-related life in low back surgery patients.

CONCLUSION

To determine the effect of the core stabilization training in improving the quality of health-related life in low back surgery patients. Supporting evidence from the literature though seems to be controversial in certain area the outcome of these study with significant statistical changes lead us to the conclusion that core stabilization training will improve the quality of health and reduced pain and improve strength in low back surgery patients. So, this study supports research hypotheses "There is significance effect of core stabilization training in improving the quality of health-related life in low back surgery patients.

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