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Effectiveness of Core Stability Exercises with Abdominal Drawing in Maneuver in Non Specific Low Back Pain

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Abstract **Original Research Article**

Background: Non specific low back pain is characterized as a tension, stiffness and soreness in region below lower costal margins and above the inferior gluteal margins, with or without any referred pain in legs and is not attributable to any specific cause. The pain may affect the individual over a long period of time, at least once in lifetime. ***Objective:*** To determine the effectiveness of core stability exercises with abdominal drawing in maneuver in patients with non specific low back pain. ***Methods:*** 60 patients are included in the study both male and female with unequal proportion e.g. 26 male patients and 34 female patients. After conservative measures, core stability exercises are performed. Treatment is provided for 6 days a week for 2 weeks. Pain and disability level are measured by "Visual Analogue Scale" and "Oswestry Disability Index" at the beginning and end of the treatment protocol. ***Results:*** The mean of Visual Analogue scale Before Treatment is 6.3833±1.04300 and of After Treatment is 2.2500±1.68367. The mean of ODI total Score before Treatment is 29.8833±5.00878 and of After Treatment is 16.6000±6.72511. The value of T for VAS measured with Paired Samples t-test is 19.757 and for ODI is 19.011 with P value of .000. Pre treatment Pearson Chi-Square test value for ODI was 5.297 with significance .258 and after treatment the value is 1.188 with significance .880, which show significant difference in scores. ***Conclusion:*** It is concluded from the present study that if patients of non specific low back pain are treated with core stability exercise program with abdominal drawing in maneuver, their pain and disability can be managed more effectively.

Keywords: Core Stability Exercises, Abdominal Drawing, Low Back Pain, Visual Analogue Scale.

ABBREVIATIONS

UHS: University of Health Sciences
AIMC: Allama Iqbal Medical College
WHO: World Health Organization
JHL: Jinnah Hospital Lahore
LBP: Low Back Pain
ADIM: Abdominal Drawing in Maneuver
VAS: Visual Analogue Scale
ODI: Oswestry Disability Index
ADL: Activities of Daily Living
IADL: Instrumental Activities of Daily Living

INTRODUCTION

Definition of Non Specific Low Back Pain

Non specific low back pain is characterized as a tension, stiffness and soreness in region below lower costal margins and above the inferior gluteal margins, with or without any referred pain in legs and is not attributable to any specific cause. The pain may affect the individual over a long period of time, at least once in lifetime [1, 2].

Prevalence of NSLBP

Non specific low back pain is defined as the low back pain without any obvious disease or cause. Lifetime prevalence of low back pain is about 80% and point prevalence of it ranges from 12% to 33% of which 90% cases of acute episodes of low back pain recover in approximately six weeks. On the other way, people who have experienced first episode of low back pain, 62% of

them produce chronic symptoms which last for more than one year [3].

Stages of NSLBP

Based on duration or length of time symptoms persist; non specific low back pain can be categorized into acute, sub-acute and chronic stages. Patients presenting with a complaint of low back pain with a history less than 6 weeks will fall into acute stage. NSLBP can be sub-acute if patient present within 6 weeks and 12 weeks of being in pain and if the symptoms last for more than 12 weeks it will be placed in the category of chronic stage [4].

Risk factors of NSLBP

Multiple risk factors can be associated with occurrence of low back pain. These include age, gender, lifestyle, physical demands of working place, social support, psychosocial profile and perception of pain by patient [5].

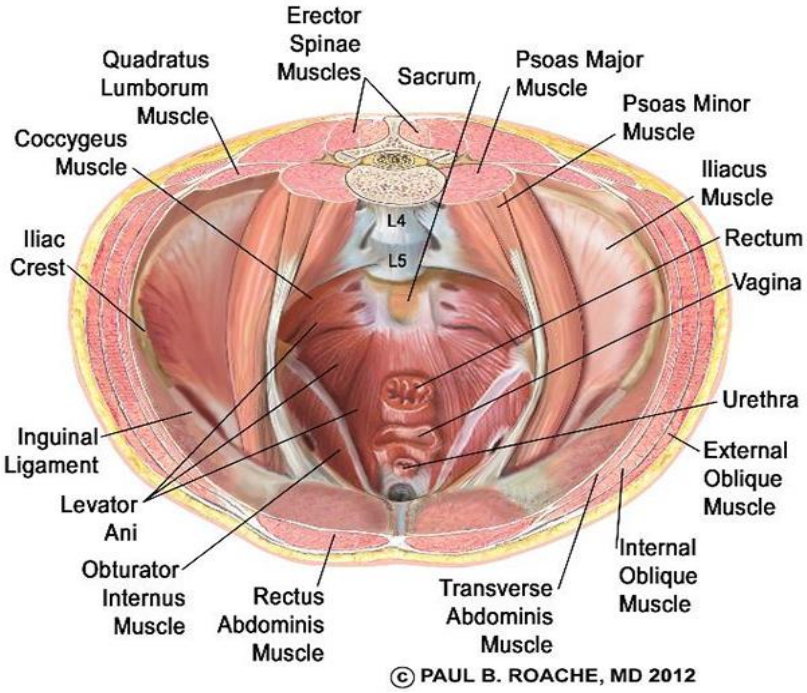
Consequences of untreated NSLBP

When a patient has developed non specific low back pain, he often starts to live a sedentary life style because of the fear that movement causes the pain and does not involve in any kind of activity and exercise intervention. It is very harmful for the patient to remain inactive for a long period of time because the decreased level of activity for a long period of time ultimately leads to deconditioning phenomenon [6].

Due to inactivity after non specific low back pain, muscle atrophy can occur. Also the muscle firing is inhibited, due to which spinal mechanics may altered and leads to exacerbation of pain-spasm-pain cycle which leads to more dysfunction, less endurance and delayed return to play [7].

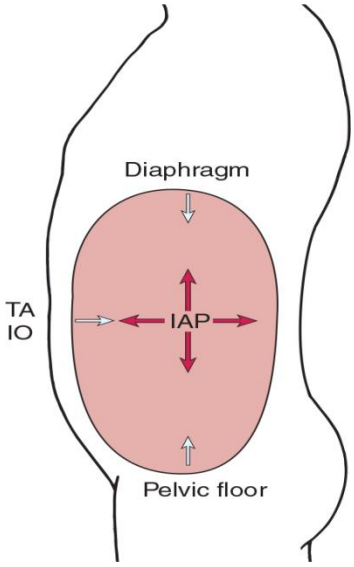
Core Muscles

The core is like a muscular box which has abdominal muscles anteriorly, paraspinal and gluteal muscles posteriorly, diaphragm superiorly and muscles of hip girdle and pelvic floor inferiorly. Many muscles present inside this box not only act as stabilizers of the spine but also are responsible for transmission of forces through kinetic chain [8].



Sub Systems of Core

According to Punjabi [9] the core consists of 3 subsystems. 1) The passive (consisting of the ligaments of the spine which are responsible for end range stability of the spine). 2) The active (spinal muscles and tendons, responsible for force production necessary to maintain spinal stability). 3) The neural control subsystem (which receives information from spinal muscles and tendons, interpret that for determination of requirement of force necessary for stability of spine and then force production adjustment according to muscles). For normal spinal mechanics, optimization and integration of these three subsystems is very important. Impairment of one of these subsystems can cause spinal column's instability which ultimately leads to pain, dysfunction and injury [7].



Abdominal Drawing-In Maneuver

Abdominal drawing in maneuver is mainly for the strengthening of deep abdominal muscles e.g transverse abdominis, internal oblique and external oblique. This maneuver is the method of exercise that causes the increase of abdominal pressure by inside pulling of abdominal walls when transverse abdominis and oblique muscles of abdomen are contracted. Stability of the lumber spine is effectively accomplished due to this increased abdominal pressure. It also produces contractions of muscles which decreases the excessive pelvic tilts and lordosis of spine which is very effective for the treatment of low back pain [10].

Treatment of NSLBP

The success of low back pain rehabilitation procedures depends more on functional status and symptoms than determining the definitive cause related to the anatomy of the back [7].

Exercises of different types have been advised for treatment of chronic low back pain, these include core stability exercises and strengthening exercises of muscles, aerobic exercises of low to moderate or high intensity, also exercises to increase flexibility [11].

Strengthening exercises and neuromuscular exercises for the core muscles play a very important role in restoration of spinal column's stability thus minimizing the instability associated with pain [7].

The main focus of core muscle strengthening exercises is on stabilization of muscles of gluteal, paraspinal and abdominal regions [7].

Operational Definitions

Non Specific Low Back Pain

Non specific low back pain is characterized as a tension, stiffness and soreness in region below lower costal margins and above the inferior gluteal margins, with or without any referred pain in legs and is not attributable to any specific cause.

Core Stability: It is the ability of the vertebral column to maintain equilibrium within its physiologic limits during static or dynamic postures.

Abdominal Drawing-In Maneuver

Abdominal Drawing-In Maneuver is the exercise method which increases the intra abdominal pressure by pulling the abdominal walls to the inside by the contraction of transverses abdominis and oblique abdominals.

Pain: Pain is the unpleasant sensation or feeling of discomfort (Measured by visual analogue scale).

Disability: It is the inability of a person to perform functional activities of daily living. (Measured by Oswestry Disability Index).

LITERATURE REVIEW

In a study conducted by [8] on "core stability exercise principles" stated that core strengthening exercises has a very strong theoretical basis in the prevention and in the treatment of low back pain. Core stability exercises have also their strong roles in other musculoskeletal conditions, therefore used widely in clinical settings for patients betterment. These exercises help to reduce pain and enhance functional status in patients of low back pain.

Another study conducted on "core stability exercise versus general exercise for chronic non specific low back pain" revealed that when compared core stability exercises with general exercises, the efficacy of core stability exercises was more in reduction of pain and disability and improvement of functions related to back in chronic low back pain only

for short term. But long term effects of both of these exercises were not significantly different [12].

In another study conducted by [13] on "segmental stabilization and muscular strengthening in chronic low back pain" revealed that in patients with non specific chronic low back pain both strengthening exercises and segmental stabilization exercises effectively decrease functional disability and pain. Activation capacity of transverses abdominus muscle is improved by segmental stabilization and not by strengthening exercises. Segmental stabilization exercises were superior to strengthening exercises regarding all variables of non specific chronic low back pain.

Another study conducted on "efficacy of breath held at maximum expiration on transverse abdominis strength, pain and disability in patients with non specific low back pain" concluded that core stability along with breath held at maximum expiration is much better treatment choice than only core stability exercises in non specific chronic low back pain. At maximum expiration. Breath held increases the strength of transverse abdominis and decreases the pain and disability of low back patients [14].

In a study conducted by [15] on "impact of short duration (4 weeks) core stability exercises on depression, anxiety and stress status of adult patients with chronic low back pain" revealed that in patients suffering from chronic low back pain exercise programs can be performed effectively and safely. Core stability exercises of short duration can decrease level of anxiety, depression and stress because these are more economical in both money and time.

OBJECTIVE OF STUDY

Main objectives of this study include:

Primary Objectives

- To determine the effectiveness of core stability exercises with abdominal drawing in maneuver in patients with non specific low back pain.

Secondary Objectives

- To improve patient's health status and quality of life.
- Purpose of this study was to establish best and efficient protocol for treatment of non specific low back pain.

RESEARCH HYPOTHESIS

Null Hypothesis

H_0: There is no significant effect of core stability exercises with abdominal drawing in maneuver to reduce pain and improve function in patients with non specific LBP.

Alternate Hypothesis

H_1: Core stability exercises with abdominal drawing in maneuver significantly reduce pain and improve function in patients with non specific LBP.

MATERIALS AND METHODS

Study Design: Case series

Settings: Jinnah Hospital Lahore

Duration of Study: The duration of the study is 4-6 months after the approval of synopsis from August 2016 to January 2017.

Sampling Technique: Purposive / judgmental sampling.

Study Population and Sample Size: Study population: Patients of age 20-60 years, diagnosed with non specific low back pain.

Sample Size

To estimate a proportion
Confidence level = 90%
Acceptable difference = 0.10
Assumed proportion = 0.80 (80% subjects responded to core stabilization exercises with improvement in Activities of daily life (ADL) from study of Chaudry et al)
Required sample size = 60

Sample Selection

Inclusion Criteria

- Patients of age limit 20-60 years
- Both males and females
- Patients with moderate to severe disability on ODI
- Patients with sub-acute and chronic stages of non specific LBP
- Patients with VAS of grade 8 or below
- Patients with diagnosed non specific low back pain

Exclusion Criteria for the Students

- Any previous or recent experience in core strengthening
- Patients who are on regular fitness program
- Past history of spine or rib fracture or injury
- Past history of abdominal surgery
- Spinal or disc pathologies
- Patients having any infectious and inflammatory disease
- Patients with cognitive problems
- Patients not willing to participate

Details of Intervention

The moist heat pack was applied for 15 minutes. Moist heat pad were pre-immersed in a hydro collator having temperature 60^{O}C. They were wrapped

in 6 layers of towel before application. According to patient tolerance level number of layers was increased or decreased. Session/set: 1 session per day, 6 days a week for 2 weeks.

Exercises Protocol

Core stability exercises were adopted from [8], basic exercises were added in the program.

1) Supine Abdominal Draw in

Patient lies on a table or mat on his back. His feet are flat on the table or mat with knees up. He pulls the abdominals in and push his back on the table or mat. Maintain this position for 5-7 seconds. Repeat 10 times.

2) Supine Abdominal Draw In With Heel Slide

Patient lies on a table or mat on his back. While maintaining his abdominal draw in, he moves his knees back towards the buttock. Maintain this position for 5-7 seconds and then return to the starting position. Repeat 10 times each leg.

3) Supine Abdominal Draw In With Leg Lifts

Patient lies on a table or mat on his back. While maintaining his abdominal draw in, he lifts his leg up. Maintain this position for 5-7 seconds and then return to the starting position. Repeat 10 times with each leg.


4) Supine Abdominal Draw In With Bridging

Patient lies on a table or mat with hips and knees bent at 90 degrees with feet flat on the floor and arms palm down by the sides. Draw in abdominals and maintain this position throughout the exercise. Slowly raise your hips off the table or mat until your knees, hips and shoulders are in line with each other. Hold this position for 5-7 seconds and then return to the starting position. Repeat 10 times.




5) Prayer → Cat → Camel

Start on all fours**. Prayer**- the patient Exhales as he sits back onto heels, lower his head, tuck chin and reach arms out**. Cat**- the patient Inhales as he arches the back up and hollow out abdominals while head remains tucked. **Camel**- Exhale and lower abdomen and reach chin towards ceiling. Tuck chin and sit back into Prayer position. Repeat 5 times

Data Collection Tools

- Oswestry low back pain disability questionnaire
- Visual Analogue Scale

Data Collection

- On the initial appointment the patients were assessed to rule out the possibility of presence of any of the signs mentioned in the exclusion criteria. After that they were requested or offered to participate in the study. A detailed consent form was duly signed by each patient willing to participate in the study (Appendix A).
- Pain and level of functional disability were the outcome measures. Intensity of pain was measured by Visual Analogue Scale (VAS) that is reliable and valid tool to measure pain intensity [2, 16]. Disability in performing functional activities was assessed by a valid and reliable questionnaire i.e. Oswestry disability index (ODI) which has been in use of clinicians to asses musculoskeletal disability since 1980 [17]. Before the initiation of treatment the scores of VAS and ODI are measured, then the patients were given with the intervention and post treatment scores of VAS and ODI were again taken.

DATA ANALYSIS

Data is analyzed by SPSS version 20.0

Ethical Considerations

Approval from the management and ethical committee of Jinnah Hospital Lahore was taken to conduct research. Informed consent of the patients was taken and their privacy, confidentiality and safety were secured. It was assured that all the patients were being treated honestly without any biasness for results. All patients were allowed to withdraw from study any time.

DATA ANALYSIS

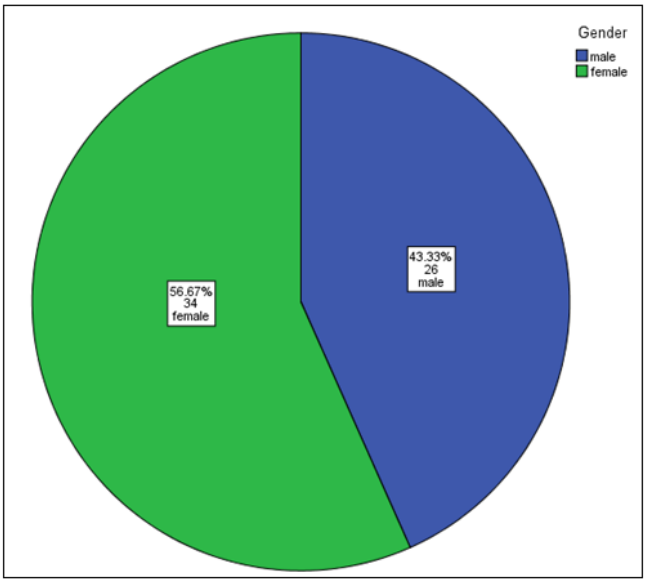
Table of Statistics

Statistics						
		Age of LBP patient	Visual Analogue Scale	Total Pre Treatment Score	Visual Analogue Scale	Post Treatment Total Score
N	Valid	60	60	60	60	60
	Missing	0	0	0	0	0
Mean		35.2833	6.3833	29.8833	2.2500	16.6000
Std. Deviation		7.08805	1.04300	5.00878	1.68367	6.72511

The patients included in this study have mean age of 35.2833±7.08805. The mean of Visual Analogue scale Pre Treatment is 6.3833±1.04300 and of Post Treatment is 2.2500±1.68367. The mean of ODI total Score Pre Treatment is 29.8833±5.00878 and of Post Treatment is 16.6000±6.72511.

Table of statistics of age

Statistics		
Age		
N	Valid	60
	Missing	0
Mean		35.2833
Median		35.0000
Mode		38.00
Std. Deviation		7.08805
Minimum		23.00
Maximum		51.00



Pie Chart of Gender

A sample of 60 patients is taken in the study, including 34 females and 26 males, which show greater prevalence of non specific LBP in females.

Table of Paired Samples Statistics of VAS

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 1	Visual Analogue Scale Pre. Treatment	6.3833	60	1.04300
	Visual Analogue Scale Post. Treatment	2.2500	60	1.68367

Table of Paired Samples Test of VAS

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Visual Analogue Scale Pre Treatment – Visual Analogue Scale Post Treatment	4.13333	1.62049	.20920	3.71472	4.55195	19.757	59	.000

Pair 1 has T-test value of (t=19.757) which is significant (p= .000)

Table of Paired Samples Statistics of ODI

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 2	Total Pre Treatment Score	29.8833	60	5.00878
	Post Treatment Total Score	16.6000	60	6.72511

Table of Paired Samples Test for ODI

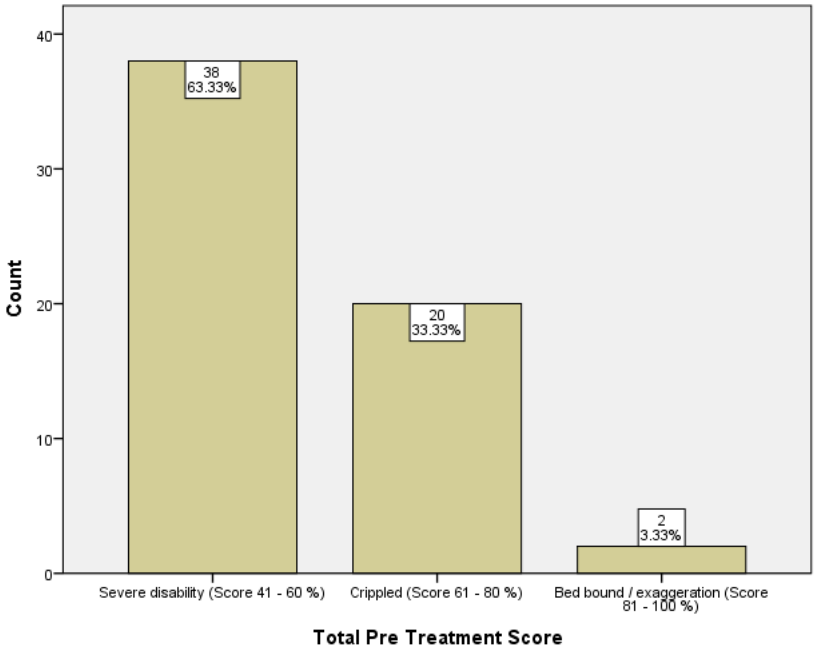
Paired Samples Test									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 2	Total Pre Treatment Score - Post Treatment Total Score	13.28333	5.41214	.69870	11.88523	14.68144	19.011	59	.000

Pair 2 also has T-test value of (t=19.011) which is significant (p= .000)

Table of Total Pre Treatment Score of ODI

Total Pre Treatment Score				
		Frequency	Percent	Cumulative Percent
Valid	Severe disability (Score 41 - 60 %)	38	63.3	63.3
	Crippled (Score 61 - 80 %)	20	33.3	96.7
	Bed bound / exaggeration (Score 81 - 100 %)	2	3.3	100.0
	Total	60	100.0	

Before treatment 38 patients out of total 60 patients fall into category of severe disability (63.3%), 20 patients in the crippled (33.3%) and 2 patients were bed bound (3.3%).

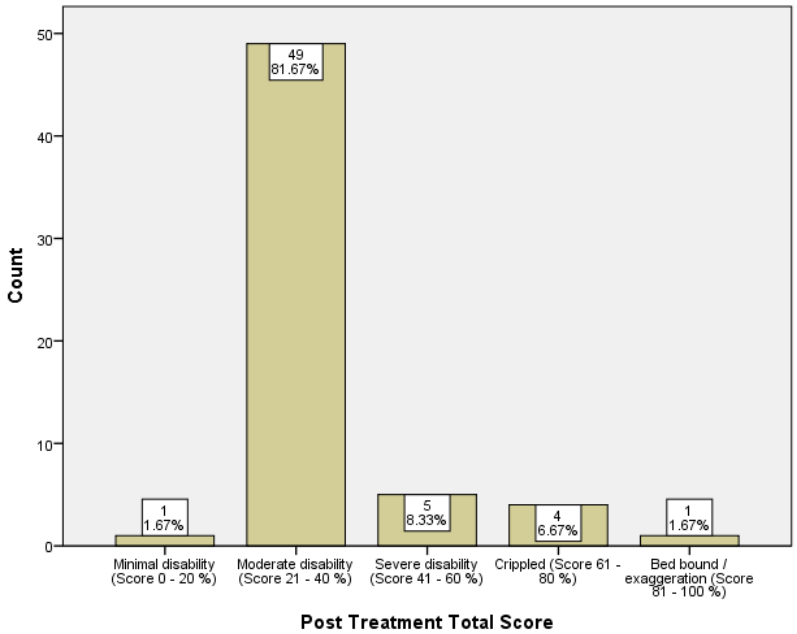


Bar Chart of Total Pre Treatment Score of ODI

Table of Total Post Treatment Score of ODI

Post Treatment Total Score				
		Frequency	**Percent**	**Cumulative Percent**
Valid	Minimal disability (Score 0 - 20 %)	1	1.7	1.7
	Moderate disability (Score 21 - 40 %)	49	81.7	83.3
	Severe disability (Score 41 - 60 %)	5	8.3	91.7
	Crippled (Score 61 - 80 %)	4	6.7	98.3
	Bed bound / exaggeration (Score 81 - 100 %)	1	1.7	100.0
	Total	60	100.0	

After treatment 1 patient out of total 60 patients fall in category of minimal disability (1.7%), 49 patients in category of moderate disability (81.7%), 5 patients were in severe disability (8.3%), 4 patients were crippled (6.7%) and 1 patient was bed bound (1.7%).



Bar Chart of Total Post Treatment Score of ODI

Crosstab

Crosstab					
			Gender		Total
			Male	Female	
Post Treatment Total Score	Minimal disability (Score 0 - 20 %)	Count	1	0	1
		% within Gender	3.8%	0.0%	1.7%
	Moderate disability (Score 21 - 40 %)	Count	19	30	49
		% within Gender	73.1%	88.2%	81.7%
	Severe disability (Score 41 - 60 %)	Count	4	1	5
		% within Gender	15.4%	2.9%	8.3%
	Crippled (Score 61 - 80 %)	Count	2	2	4
		% within Gender	7.7%	5.9%	6.7%
	Bed bound / exaggeration (Score 81 - 100 %)	Count	0	1	1
		% within Gender	0.0%	2.9%	1.7%
Total		Count	26	34	60
		% within Gender	100.0%	100.0%	100.0%

Chi Square Test

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.297	4	.258

Crosstab

Crosstab					
			Age		Total
			< 40 years	> 40 years	
Post Treatment Total Score	Minimal disability (Score 0 - 20 %)	Count	1	0	1
		% within Age	2.3%	0.0%	1.7%
	Moderate disability (Score 21 - 40 %)	Count	36	13	49
		% within Age	81.8%	81.3%	81.7%
	Severe disability (Score 41 - 60 %)	Count	3	2	5
		% within Age	6.8%	12.5%	8.3%
	Crippled (Score 61 - 80 %)	Count	3	1	4
		% within Age	6.8%	6.3%	6.7%
	Bed bound / exaggeration (Score 81 - 100 %)	Count	1	0	1
		% within Age	2.3%	0.0%	1.7%
Total		Count	44	16	60
		% within Age	100.0%	100.0%	100.0%

Chi Square Test

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.188	4	.880

RESULTS

A total of 60 patients are included in the study of age 20-60, with unequal proportion of males and females i.e. 26 male patients and 34 female patients. The mean age of all patients is 35.2833±7.08805 (Mean= 35.2833, S.D=7.08805). Pain intensity is measured by Visual Analogue Scale before and after the treatment. Before treatment the mean VAS Score was 6.3833±1.04300 (Mean=6.3833, S.D=1.04300). After the treatment the patient's condition of pain is improved with a mean value of VAS of 2.2500±1.68367 (Mean=2.2500, S.D=1.68367)

The degree of disability of patients is measured by a standardized questionnaire "Oswestry Disability Index" both before and after the treatment. The mean of ODI before the treatment was 29.8833±5.00878 (Mean=29.8833, S.D=5.00878) and that of after the treatment is 16.6000±6.72511 (Mean=16.6000, S.D=6.72511) which show significant reduction in degree of disability of patients.

The value of T for Visual Analogue Scale measured with Paired Samples t-test is t=19.757, which is highly significant (p= .000)

The value of T for Oswestry Disability Index measured with Paired Samples t-test is t=19.011, which is also very significant (p= .000)

Before treatment 38 patients out of total 60 patients fall into category of severe disability (63.3%), 20 patients in the crippled (33.3%) and 2 patients were bed bound (3.3%).

After treatment 1 patient out of these total 60 patients fall in category of minimal disability (1.7%), 49 patients in category of moderate disability (81.7%), 5 patients were in severe disability (8.3%), 4 patients were crippled (6.7%) and 1 patient was bed bound (1.7%).

DISCUSSION

Non specific Low back pain is one of the most prevalent musculoskeletal problem with a lifetime prevalence of about 80%. The main objective of this study was to determine the effectiveness of core stability exercises with abdominal drawing in maneuver in patients with non specific low back pain.

A sample of 60 patients was included in this study in which the total number of female patients was greater than male patients. That shows greater incidence of non specific low back pain in females, the reason may be the presence of more number of psychosocial risk factors as compared to males like greater BMI, pregnancy, hormonal changes, osteoporosis as well as postpartum complications and depression anxiety. The same results are favored by a systematic review of the global prevalence of non specific low back pain that concluded the highest prevalence among female individuals [18].

The highest incidence of non specific LBP in housewives (64.2%) are showed in the study, probably due to greater BMI of them as compared to working women [19]. Also the people who are doing job under someone else are mostly occupied and under stress so the complaint of non specific low back pain was less among self-employed people.

The main finding of this study is that a treatment program containing specific stabilization exercises e.g. core stability exercises with abdominal drawing in maneuver, is considerably very effective in reducing pain, improving functional status and improving health related quality of life.

ODI score improved significantly with core stability exercises with abdominal drawing in maneuver, from pre to post treatment evaluation It is indicated from the statistical analysis that P value for ODI was significant (p=.000). More percentage of patients falls into moderate disability having score from 20% - 40%.Same results are showed in another study that pain and disability levels are reduced in patient with non specific LBP through the core stability exercise programs of 4 weeks.

Another aim of this study was to improve the quality of lives by reducing pain and functional disability so that the patients will be able to perform their ADLs and IADLs more efficiently. Statistical analysis indicate that P value for the pain change at VAS is significant (p=.000). VAS score improved significantly with core stability exercises with abdominal drawing in maneuver.

CONCLUSION

It is concluded from the present study that when patients of non specific low back pain are treated with core stability exercise program with abdominal drawing in maneuver, with prior application of a preparation modality e.g. moist heat pack, there is reduction in level of pain and disability, and improvement in functional status and health related quality of life

LIMITATIONS

Following are the limitations of this study

- The sample size was very small.
- The number of treatment sessions was also short.
- The follow up of patients is not done to check for the recurrence of low back pain.
- The patients coming to outpatient department of Jinnah Hospital Lahore are taken only so results & conclusions are only applicable to those patients

who come for treatment in Jinnah hospital Lahore from where data was collected.

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In the name of ALLAH who created us all.

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Appendix

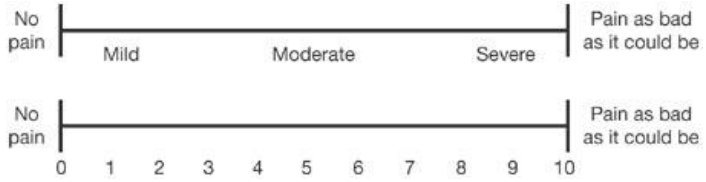
Effect of core stability exercises with abdominal drawing in maneuver in non specific low back pain

Serial #:

Patient Name: Father/husband's name: Gender:
Age: Occupation: Height: ft
Weight: kg BMI: Address:

Work type:	**Working Hours:**
Computer use: Yes/No	Hours of usage of computer:
Life style: sedentary/Active	Sleeping Hours:
History of Osteoarthritis: Yes/No	
Stress: Yes/No	
Duration of pain: /Weeks /Months /Years	

Pain intensity "Visual Analogue scale"



"OSWESTRY DISABILITY INDEX QUESTIONAIRE"

Sec-1: Pain intensity

I can tolerate the pain without using pain killers	00
The pain is bad but I manage without taking pain killers	01
Pain killers give complete relief from pain	02
Pain killers give moderate relief from pain	03
Pain killers give very little relief from pain	04
Pain killers have no effect on the pain.	05

Sec-2: Personal care

I can look after myself normally without causing extra pain	00
I can look after normally but it causes extra pain	01
It is painful to look after myself and I am slow and careful	02
I need some help but manage most of my personal care	03
I need help every day in most aspects of self care	04
I do not get dressed wash with difficulty and stay in bed	05

Sec-3: Lifting

I can lift heavy weights without extra pain.	00
I can lift heavy weights but with some pain.	01
Pain prevents me from lifting heavy weights off the floor but it can manage if they are conveniently positioned on some height.	02
Pain prevents me from lifting heavy weights bit I can manage medium weights if they are conveniently positioned.	03
I can lift only very light weights.	04
I cannot lift anything at all.	05

Sec-4: Walking

Pain does not prevent me walking any distance.	00
Pain prevents me walking more than 1 mile.	01
Pain prevents me walking more than 0.5 miles.	02
Pain prevents me walking more than 0.25 miles.	03
I can only walk using a stick or with some support.	04
I am in bed most of the time and have to crawl to the toilet.	05

Sec-5: Sitting

I can sit in any chair as long as like.	00
I can only sit on my favourite chair as long as like.	01
Pain prevents me sitting more than 1 hour.	02
Pain prevents me sitting more than half an hour.	03
Pain prevents me sitting more than 10 mints.	04
Pain prevents me from sitting at all.	05

Sec-6: Standing

I can stand as long as I want without extra pain.	00
I can stand as long as I want but it gives me extra pain.	01
Pain prevents me from standing for more than 1 hour.	02
Pain prevents me from standing for more than 30 mints.	03
Pain prevents me from standing for more than 10 mints.	04
Pain prevents me from standing at all.	05

Sec-7: Sleeping

Pain does not prevent me from sleeping well.	00
I can sleep well only by using tablets.	01
Even when I take tablets I have less than 6 hours sleep.	02
Even when I take tablets I have less than 4 hours sleep.	03
Even when I take tablets I have less than 2 hours of sleep.	04
Pain prevents me from sleeping at all.	05

Sec-8: Sex life

My sex life is normal and causes no extra pain	00
My sex life is normal but causes some extra pain.	01
My sex life is nearly normal but is very painful.	02
My sex life is severely restricted by pain.	03
My sex life is nearly absent because of pain.	04
Pain prevents any sex life at all.	05

Sec-9: Social life

My social life is normal and gives me no extra pain.	00
My social life is normal but increases the degree of pain.	01
Pain has no significant effect on my social life apart from limiting my more energetic interests.	02
Pain has restricted my social life and I do not go out as often	03
Pain has restricted my social life to my home.	04
I have no social life because of pain.	05

Sec-10: Travelling

I can travel anywhere without extra pain.	00
I can travel anywhere but it gives me extra pain.	01
Pain is bad but I manage journeys over 2 hours.	02
Pain restricts me to journeys of less than 1 hour.	03
Pain restricts me to short necessary journeys less than 30 minutes.	04
Pain prevents me from travelling except to the doctor or hospital.	05

Interpretation

0% to 20%: Minimal disability: The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise.

21% to 40%: Moderate disability: The patient experiences more pain and difficulty with sitting lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.

41% to 60%: Severe disability: pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation.

61% to 80%: Crippled: Back pain impinges on all aspects of the patient's life. These patients require a positive intervention.

81% to 100%: These patients are either bed-bound or exaggerating their symptoms.