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# "PREVALENCE OF PROLAPSED INTERVERTEBRAL DISC (PIVD) IN CAB DRIVERS: A CROSS SECTIONAL STUDY"

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## ABSTRACT:

**TITLE:**

Prevalence of Prolapsed Intervertebral Disc (PIVD) in Cab Drivers: A cross sectional study

**BACKGROUND:**

Low backpain is very common and usually occupation related. This study aimed at determining the prevalence of PIVD in cab drivers by seeing at the low back disability index due to bad posture of sitting and duration of driving in the cab drivers.

**METHODOLOGY:**

It is cross-sectional study in which 200 cab drivers has been screened for the presence of PIVD. 200 participants who were fulfilling the inclusive criteria has been taken. Then the researcher has explained about the research and the topic of research to the participants. Researchers has also explained about the PIVD, LBP which may further leads to PIVD and proper ergonomics while driving to prevent the PIVD. Participants with acute or sub-acute low back pain has been recruited. And their consent has been taken. SLR Special Test has been used to diagnose the PIVD. Then the researcher has explained about the special test and had

performed it on the participant. If the test of a participant has been positive, he has been advised further for the radiological investigations to check the severity of the bulge and further the physiotherapy treatment has been provided to the participant.

**RESULT**:

Total 200 patients were included in this study based on the inclusion and exclusion criteria. After filling the online consent form. Special test (SLR Test) is performed on the individual to diagnose the PIVD. Statistical analysis was done. All outcome measure(ODI) were analysed at the end of study. After doing the pivot study on the collected data we have found that around 41% of the cab drivers have radiating pain. among which 32% of drivers had moderate low back disability,7.5% had severe disability,1% were crippled and 0.5% had minimal low back disability resulting in hampering performance with the daily life activities and social life. Study identified the duration of driving and type of seating posture while driving as risk factors for low back pain which can further leads to PIVD among the participants.

**CONCLUSIONS**:

Study concludes that 41% drivers where having radiating pain among which 32% of drivers had moderate low back disability,7.5% had severe disability,1% were crippled and 0.5% had minimal low back disability resulting in hampering performance with the daily life activities and social life. Study identified the duration of driving and type of seating posture while driving as risk factors for low back pain which can further leads to PIVD among the participants.

**KEYWORDS:**

Low back pain, Cab drivers, Posture, Prolapsed Intervertebral Disc

# INTRODUCTION

## INTRODUCTION

Back pain is a very common malady next only to headache and affects nearly 80% of population. Low back pain is the pain which occurs at the lower back region due to muscle tension or stiffness. LBP is the most common problem and it is reported that more than 70% of people in developed countries suffers from LBP.[1]

Most common cause of back pain is bad posture which increases the strain on the Intervertebral disc and ligaments causing faster disc degeneration. Pain can arise from Intervertebral disc, ligaments, joints, muscles, nerves, etc. Other Causes of LBP- Muscles Strain or sprain, PIVD, disc degeneration, sciatica, spinal stenosis, spondylolisthesis, etc.[1]

Any abrupt, unbalanced and unwarranted movements upset the stabilizing function of the back muscles increasing the load on the disc. Hence bad posture, over loading and abrupt unbalanced movements are the cause of disc prolapsed or disc rupture.[1]

Mechanical LBP: 80% of LBP are due to mechanical cause like back muscle strain, ligament sprain and disc problems. Muscles strain and sprains are due to sudden unaccustomed activities and improper postures.[1]

There are 23 discs throughout the spine. It is thinnest in the thoracic region and thickest in the lumbar region. Each disc is interposed between the pair of vertebral bodies.[1]

Intervertebral disc in adults are avascular, the cells within it are sustained by diffusion of nutrients into the disc through the pores in the bodies.[1]

Degeneration of the disc may be prompted by changes in the permeability of cartilage end plate. Movement and weight bearing helps in diffusion of disc.[1]

Disc consist of two parts centrally it is nucleus pulposus and peripherally it has annulus fibrosis. It is thick anteriorly and thin posteriorly more so in the posterolateral aspect. Hence posterolateral disc prolapse is more common.[1]

With age, water content of the disc decreases fibrous tissue and cartilaginous cells increases and the nucleus becomes granular and friable. Disc apart from giving the spine its mobility, functions as a shock absorber.[1]

Non-mechanical LBP: It is defined as low back pain not attributable to a recognizable, known specific pathology e.g., Infections, Tumors, Osteoporosis, Spine fracture, Cauda equine syndrome.[1]

Heavy lifting, repetitive movements & sitting at a desk all day can take a troll on your back.[1]

Common cause of occupational LBP: natural curves, which exerting to much force on back can cause injury. Repeating certain movements can lead to muscle fatigue or injury. Slouching can lead to muscle fatigue & injury. Percentage of prevalence: 73.5% in drivers

Intervertebral disc is under constant pressure with degenerative changes and weak state of disc the annulus can bulge into the space containing the nerve root causing pain due to compression.[1]

Types of Disc Prolapse- Disc Protrusion, Disc Extrusion, Disc Sequestration. LBP (Low Back pain) is a serious occupation disease. Driving is the job causing occupational LBP. Occupational LBP: It is the largest single health problem related to work observation and the most common cause of incapacity among workers, younger than 45 years old world wide, 37% of LBP was attributed to occupation. Employees whose job involves lifting, bending, twisting or repetitive spinal movements are, most at risk for these injuries.

It has been pointed out that the factors leading to occupational LBP includes exposure to vibration, repeatedly lifting any heavy objects, strained posture and sitting or standing work for prolong period of time.[2]

Due to driving car for prolonged period of time and poor comfort the stress on the spine increase which further can result to back pain and then to severe conditions like, PIVD (prolapsed Intervertebral disc), musculoskeletal problems, spondylolisthesis, etc.[2]

Can drivers have been found to have high prevalence rates of back problems.[2]

Due to prolong sitting in particular position while driving car can cause stiffness in the back and also in legs and driving the car on rough roads without understanding proper ergonomics can lead to major problems.[2]

Due to uncomfortable seat and without knowing the proper ergonomics driving car for prolong period of time can cause major spine problems.[2]

Some studies have shown that driving professional is associated with the risk factors. Various environmental factors combine to overload the vertebral column and its supportive structures. During car driving excessive exposure to whole body vibration due to rough roads or potholes.[3]

Due to the rough & uneven roads as well as poor & prolonged sitting posture will create major stress on spinal area. Although, it is the major contributing factors for the higher onset & development of musculoskeletal conditions among professional cab or car drivers. [4]

Lesion in an Intervertebral disc are the most common cause of low back pain & sciatica. The annual incidence of low back pain is estimated at 5% but only 1% develops radiculopathy lumbar disc prolapsed is a disease most common between 30-50 years' age with a male preponderance as associated with repeated mechanical force. It may occur at any level but 95% of disc prolapse occur at L4-L5 or L5-S1.[4]

Symptoms of lumbar disc herniation are relatively common in the general population although the prevalence rates vary widely different studies symptoms severity also varies and in many patient pain

and loss of function may lead to disability and some measure spine problems. Physiotherapy treatment is choice in patient with symptoms caused by lumbar disc herniation.[4]

In clinical practice a broad range of physio therapeutic modalities such as TENS, ULTRASOUND, IFT, SWD, TRACTION and cryotherapy has been revealed to be helpful.[4]

Study aimed to investigate the prevalence of male cab drivers who operates cabs. Usual history of lumbar disc herniation is of repetitive LBP, radiating to the buttocks and decreased by rest.[5]

Pain is increased by flexion, sitting, straining, sneezing, coughing, etc. Pain is decreased by rest and in semi-fowler positions. Radiculopathy- This refers to pain in the distribution of the sciatica nerve and is invariably due to disc herniation this is called sciatica.[6]Nerve root compression about 95% of disc prolapse takes place through the L4-L5 region compressing the L5 nerve root. The other nerve roots commonly involved are L4 and S1 due to disc prolapsed between L3-L4 and L5-S1 respectively [7]

# REVIEW OF LITERATURE

## REVIWE OF LITRATURE:

1. **Occupational factors associated with low back pain in urban taxi drivers.**

   **Jiu - Chiuan Chen, Wen – Ruey and David Christiani (2005)[8]**

A cross- sectional data was collected from the taxi drivers. Health study standardized instrument were used to collect the information on personal factors, work related, physical & psychosocial factors and driving time profiles LBP prevalence was assessed using the modified Nordic Musculoskeletal Questionnaire. The results show that of 1242 drivers, 5% reported LBP in the past 12 months they found that driving time >4hrs/day, frequently bending / twisting activities while driving are the major occupational factors significantly associated with higher LBP prevalence in taxi drivers. ($p<0.001$)

2. **Low back pain disorders in agricultural tractor drivers exposed to whole- body vibration and postural stress.**

   **Massimo Bovenzi, Alberto Betta (1994)[9]**

Occurrence of LBP was investigated in a population of 1155 tractor drivers exposed to whole body vibration & postural stress (response rate 91.2%) & in a control group of 220 office worker (response rate 92.2%) subjects were questioned about several types pf low back symptoms and various work & individual related risk factors, by using a standard questionnaire. Prevalence of LBP was found to be greater in the tractor drivers. LBP were found to be significantly associated with both vibration and postural loads. Prolong sitting or standing in one position and due to poor posture the stress on the spine increases which can leads to musculoskeletal problems & may further lead to PIVD. More exposure data are needed in order to improve the knowledge of relationship between whole body vibration exposure & LBP among professional drivers. ($p<0.05$)

3. **Manual Therapy for Management of Lumbar PIVD- an Innovative Approach.**

   **P P Mohanty, Monalisa Pattnaik (2015)[10]**

Disc Prolapse mainly occurs in L4-L5 or L5-S1 and these is most common in 30-50-year age group peoples. In this study 75 subjects with acute or sub-acute LBP due to PIVD were recruited &randomly distributed in one of the three groups. Outcome measures: pain by visual analog scale (VAS) & functional outcome measures by Oswestry disability index (ODI). Result of the study shows significant change in pain & function for all the groups after 4 weeks of treatment. At the end of treatment there was significant difference between the groups for functions.

**4. Driving of motor vehicles as a risk factor for acute herniated lumbar intervertebral disc.**

**Jennifer L. Kelsey and Robert J. Hardy (1975)[11]**

In this study of the epidemiology of the acute herniated lumbar intervertebral disc in New Haven, connected area it was found that driving a motor vehicles was associated with an (increased) risk for developing herniated disc. In this study the participants are divided into the two group and diagnosed by the examiner with the special test by the SLR & x-ray. The study shows that the men who spend half or more of their job a motor vehicles are about three times as likely to develop acute herniated lumbar disc those who do not hold such jobs. Some of the limitation of the study such as disappointing response rate (78%), the lack of control group of general population, small sample size.

**5. Prevalence of low back pain in car drivers and non-drivers.**

**Lenka Gallais (2008)[12]**

This study investigated whether there is evidence of an associated between car driving and LBP & evidence that whole body vibration contributes to LBP in car drivers. There are many limitations that arise from factors such as the study design choice of study population, sample size, response rate and the large number of factors that can influence back pain. Some studies have reported (increased)

driving, but number study has shown that the risk of LBP is greater with increased exposure to the whole body vibration from car driving further studies are needed to verify the relationship between risk factor & LBP in car divers.

**6. Therapeutic effects of selective nerve root block in case of lumbar PIVD- A prospective study.**

**Sanjiv Kumar, Reetu Verma, Gaurav Chahal, Ashish Kumar, Shah Walliulah (2019)[13]**

This prospective analytic study was designed to assess the efficacy of selective nerve root block with corticosteroids in the management of pain associated with PIVD that didn't get relief from non-surgical pharmacological treatment. In this study 40 known cases of lumbar PIVD not responding to the pharmacological treatment were given guided root & results were evaluated using VAS, ODI & SLR test over the period of 1,3,6 & 12 months. Result show that the lifetime prevalence of lumbar radiculopathy has been reported to be 5.3% in men and 3.7% in women.5, 6 Lumbar radiculopathies due to a prolapsed disc resolves spontaneously in 23-48% of patients, but up to 30% will still have pronounced symptoms after one year, 20% will be out of work, and 5-15% will undergo surgery.

**7. Health survey of professional drivers.**

**Backman AL (1983)[14]**

In Finland an investigation carried out in 1979- 1980 included both a health screening and an inquiry about the work conditions of active drivers. A cross-sectional health survey comprising of 633 male drivers showed that the, frequencies of complaints, for instance pain in the back, shoulder & neck increased in old age groups. The study showed that the most common health problem was back pain & shoulder pain. About 70% of drivers had suffered from the back pain & shoulder pain during the last month ergonomic factors concerning work posture & movements will probably explain the high frequencies of back & shoulder.

**8. Drivers of international variation in prevalence of disabling low back pain.**

**D. Coggon et.al. (2018)[15]**

This study investigated the prevalence of disabling LBP among working population is not explained by known risk factors. Baseline information about musculoskeletal pain and risk factors was elicited from 11710 participants aged 20-59 years. Who were sampled from 45 occupation groups in 18 countries. After allowance for other known and suspected risk factors, pain propensity showed the strongest association with disabling LBP. The findings indicate that difference in general propensity to musculoskeletal pain are a major driver of large international variation in the prevalence of disabling LBP among people of working age.

**9. A Comparison between the low back pain scales for patients with lumbar disc herniation: validity, reliability, and responsiveness**

**Min Yao at.al (2020)[16]**

Study aimed to compare the following scales ODI, NPRS, SF-36, RMDQ, JOABPEQ in lumbar disc herniation patients receiving conservative treatment to select the better option to assess the severity of disease. Total 353 LDH patients were enrolled for this study. The relationship of these scales were evaluated by the person correlation coefficient the results shown that the NPRS, ODI or RMDQ is recommended in studies related to LDH patients. While if the quality of life also is needed to observe, the NPRS & JOABPEQ would be the more appropriate rather than SF-36.

**10. The Sensitivity and Specificity of the Slump and the Straight Leg Rising Tests in Patients with Lumbar Disc Herniation**

**Javid Majlesi, Halit Togay, Halil Unalan, Sadik Topark (2008)[17]**

Study aimed to measure the sensitivity & specificity of the slump test and compare it with SLR test in patient with & without lumbar disc herniation. 75 patients with complaints suggestive of lumbar disc herniation were enrolled both slump and SLR test were performed on the patients. Result shown that the slump test was more sensitive than SLR in the patient with lumbar disc herniation however, the SLR was found to be slightly move specific test than slump test

# NEED OF STUDY

## NEED OF THE STUDY

To investigate the prevalence of PIVD and its risk factors among cab drivers.

There are so many studies have been provided the information regarding the relation of LBP with various spinal conditions. Also some articles gave the information about prevalence of LBP in various workers. But no study has been done on cab drivers, so this study will provide proper prevalence of PIVD in cab drivers.

To improve knowledge of cab drivers by making them understanding about the proper ergonomics which reduces the risk of PIVD.

# OBJECTIVES OF THE STUDY

## OBJECTIVE OF THE STUDY

To determine whether the PIVD is more prevalent in car drivers.

To improve knowledge of cab drivers by making them understand about the proper ergonomics.

To improve understanding of the risk factors which may contribute to the development or progression of the symptoms of PIVD.

# HYPOTHESIS

## HYPOTHESIS

**Null hypothesis:** There is no correlation between lumbar PIVD and cab drivers.

**Research hypothesis:** There is correlation between lumbar PIVD and cab drivers.

# MATERIALS AND METHODS

## MATERIALS AND METHODS

STUDY DESIGN: A cross sectional study

SOURCE OF DATA: Cab drivers from Ahmedabad (Gujarat)

POPULATION: PIVD (age: 25- 60years)

METHOD OF COLLECTION OF DATA: Convenient Method

SAMPLE SIZE: 200

DURATION OF STUDY: 6 Months

## MATERIALS AND TOOLS

**Mat:** For performing the special test on participant to diagnose PIVD participant had lie down on the mat

**Pen:** For writing the details of participants

**Paper:** To write the details of participants

**Scales:** To measure the outcomes

## METHOD OF COLLECTION OF DATA

### INCLUSION CRITERIA:

1. Patient complaining of low back pain along with or without radiculopathy in one leg or both the legs.
2. Time duration of car driving is 4-5hrs/day.
3. Acute or sub-acute low back pain which is not chronic.
4. Limited straight leg rise(SLR) 30°-70° or positive sciatica syndrome. (sciatica syndrome- sciatic nerve becomes pinched, usually by a herniated disk in your spine or overgrowth of bone on your vertebrae)
5. Lumbar flexion, extension and side flexion to the painful side will produce original symptom**.** Numbness in genital area, Pain behind the shoulder blade or in buttocks, Tingling in one or both arms or legs, Loss of control of bladder/ bowels.

### EXCLUSION CRITERIA:

1. Patient /Cab driver who don't have any symptoms of back pain and leg pain.
2. The exclusion criteria included:
3. patients with prior back surgery
4. impending Cauda equine syndrome or with Cauda equine syndrome
5. back or leg pain due to other etiologies.

## OUTCOME MEASURES

- **Oswestry disability index (ODI):** The Oswestry disability index is an index derived from the Oswestry Low Back Pain Questionnaire used by clinicians and researchers to quantify disability for low back pain.

# METHODOLOGY

## METHODOLOGY

1. It is cross-sectional study in which 200 cab drivers has been screened for the presence of PIVD.
2. 200 participants who will fulfilling the inclusive criteria has been taken.
3. Then the researcher has explained about the research and the topic of research to the participants.
4. Researchers has also explained about the PIVD, LBP which may further leads to PIVD and proper ergonomics while driving to prevent the PIVD.
5. Participants with acute or sub-acute low back pain has been recruited.
6. And their consent has been taken.

Examination of the Back –

1- Inspection (Note any postural defect)

2- Palpation – Tenderness

- Movements (All the movements of spine has been tested)

3- Evaluation of neurological system:

- Dermatomal and myotomal distribution are carefully analyzed to detect the level of lesion

4- Clinical Test: Test are based on stretching of the sciatica nerve over the prolapsed disc.

a) Forward bending to touch the toes.
b) Sitting and alternatively extending one leg and then the other.
c) Slump test: Sitting bent forward and extending one leg and then the other.
d) Straight Leg Raising Test (SLRT): Participant is in supine position. the examiner raises the leg of the patient straight one after the other. Up to 30° nerve is not put under stretch between 30°-70° nerve comes into contact with the prolapsed disc and the participant complains of pain. Beyond 70° if participant complains of pain it is usually not due to disc prolapsed but could be due to sacroiliac joint involvement

7. SLR Special Test has been used to diagnose the PIVD.
8. Then the researcher has explained about the special test and had performed it on the participant.
9. If the test of a participant has been positive, he has been advised further for the radiological investigations to check the severity of the bulge and further the physiotherapy treatment has been provided to the participant.
10. Researcher has explained about the proper sitting ergonomics while driving to prevent the PIVD.
11. Back Ergonomics: This is an extremely important aspect of back pain management as it helps in preventing recurrence. It consists of:

a) Proper postural habit

b) Proper work environment

c) Back exercises

d) Modifications of Daily routine activities

a) Sit close the steering wheel as is comfortable.
b) Place a small pillow beneath the lumbar curvature to preserve the normal lordosis.
c) Use the rear view mirror frequently and do not turn back those the vehicles.
d) Keep the knee bent.
e) Avoid stress in life by proper planning and meditation.

**FLOW CHART:**

Participants has been selected by the inclusive and exclusive criteria.

↓

Subjects has been selected by the convenience sampling method.

↓

Participants with LBP has been selected.

↓

Participants consent has been taken.

↓

Special test had been performed to diagnose the prevalence of PIVD.

↓

Outcome measures has been taken.

↓

Participants with PIVD has been selected for this study.

↓

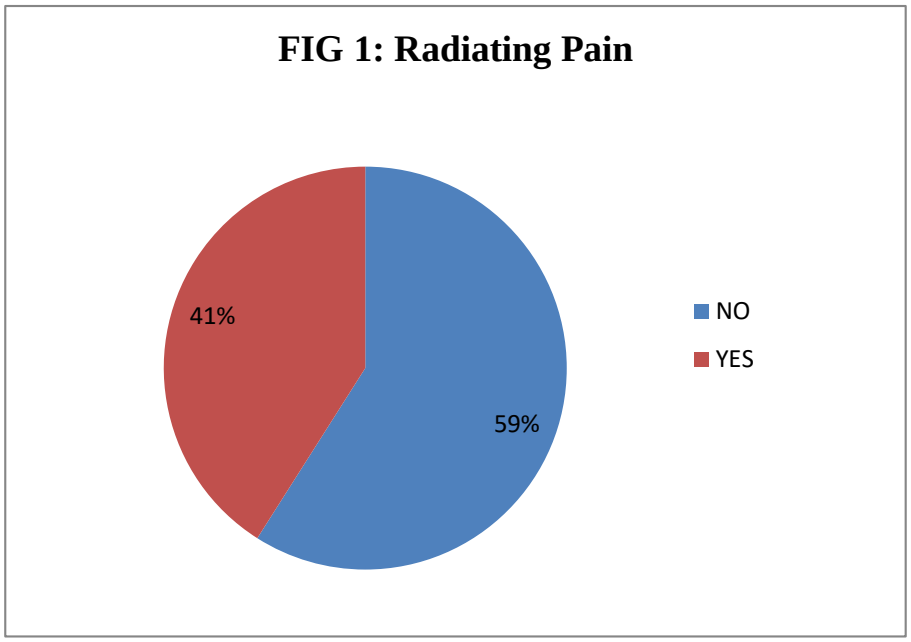
Statistical Data analysis has been done.

# RESULT

## RESULT:

Total 200 patients were included in this study based on the inclusion and exclusion criteria. After filling the online consent form. Special test (SLR Test) is performed on the individual to diagnose the PIVD.

Statistical analysis was done. All outcome measure(ODI) were analysed at the end of study.



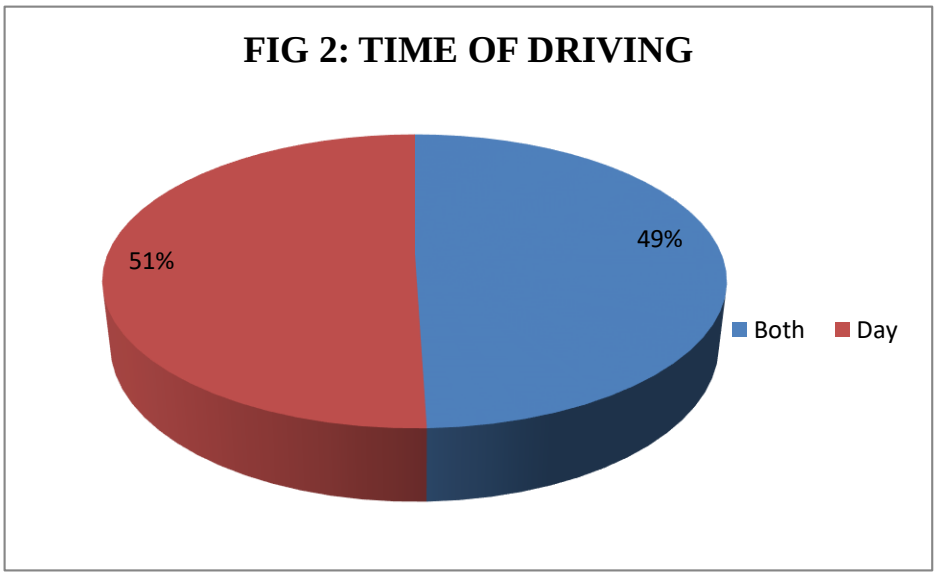


FIG 2: TIME OF DRIVING
49%
51%
Both
Day

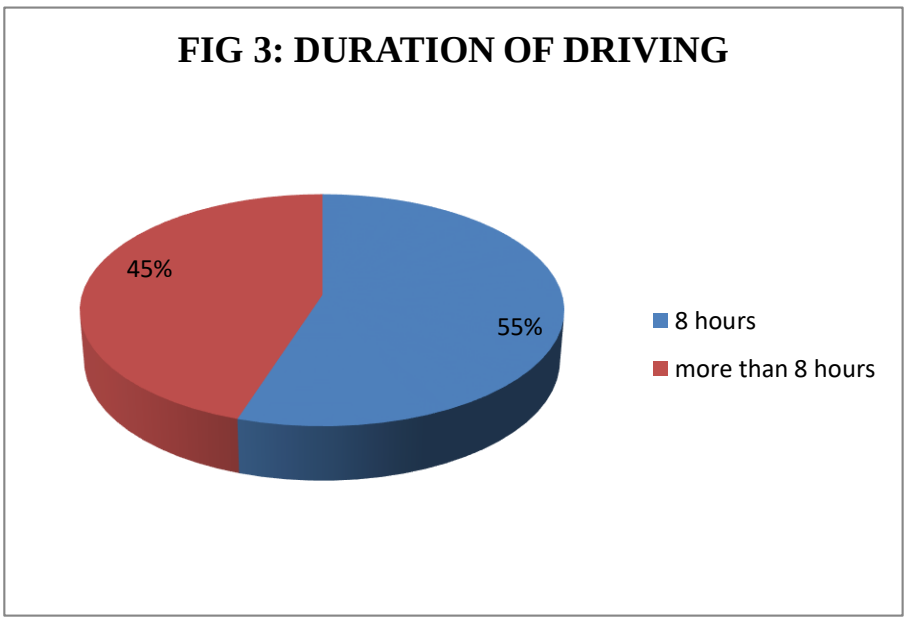


FIG 3: DURATION OF DRIVING
45%
55%
8 hours
more than 8 hours

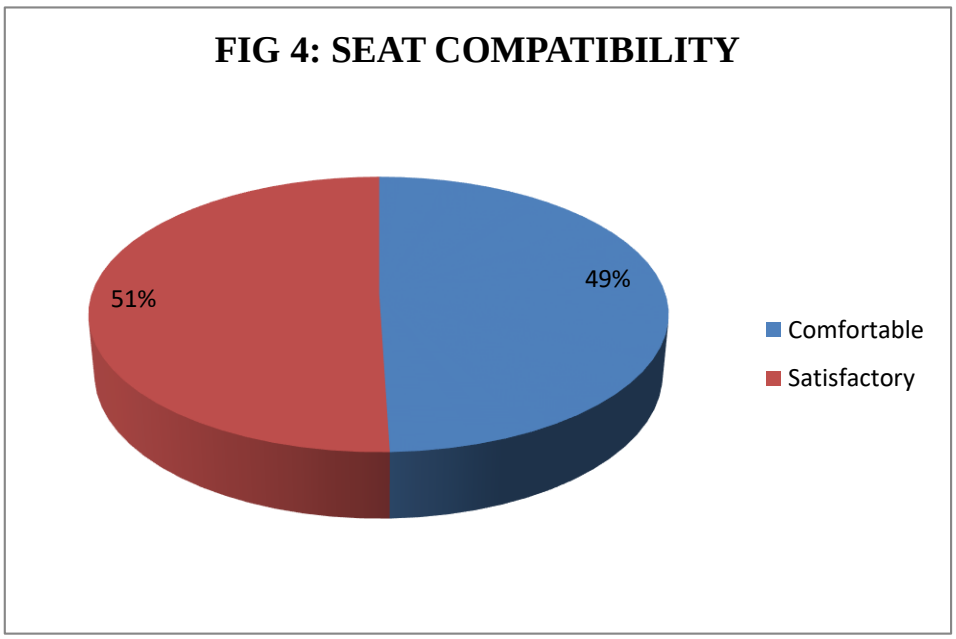


FIG 4: SEAT COMPATIBILITY
49%
51%
Comfortable
Satisfactory

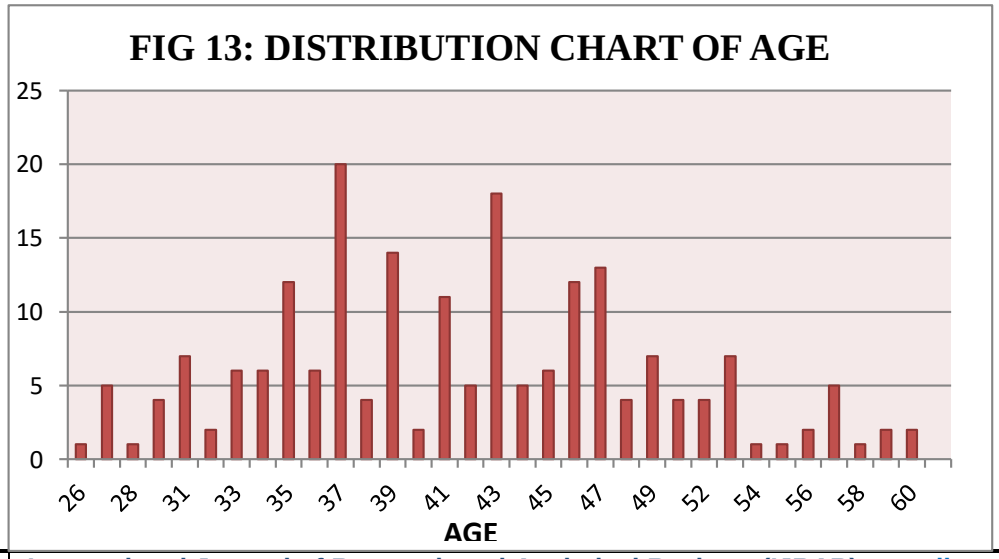


FIG 13: DISTRIBUTION CHART OF AGE
25
20
15
10
5
0
26
28
31
33
35
37
39
41
43
45
47
49
52
54
56
58
60
AGE

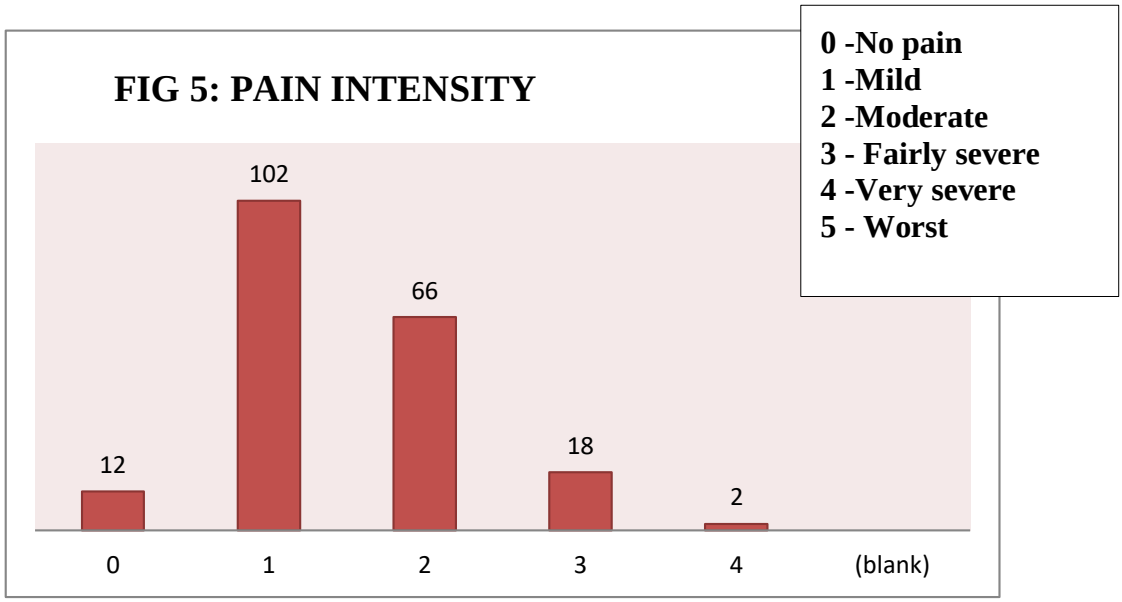


FIG 5: PAIN INTENSITY
0 -No pain
1 -Mild
2 -Moderate
3 - Fairly severe
4 -Very severe
5 - Worst
102
66
12
18
2
0
1
2
3
4
(blank)

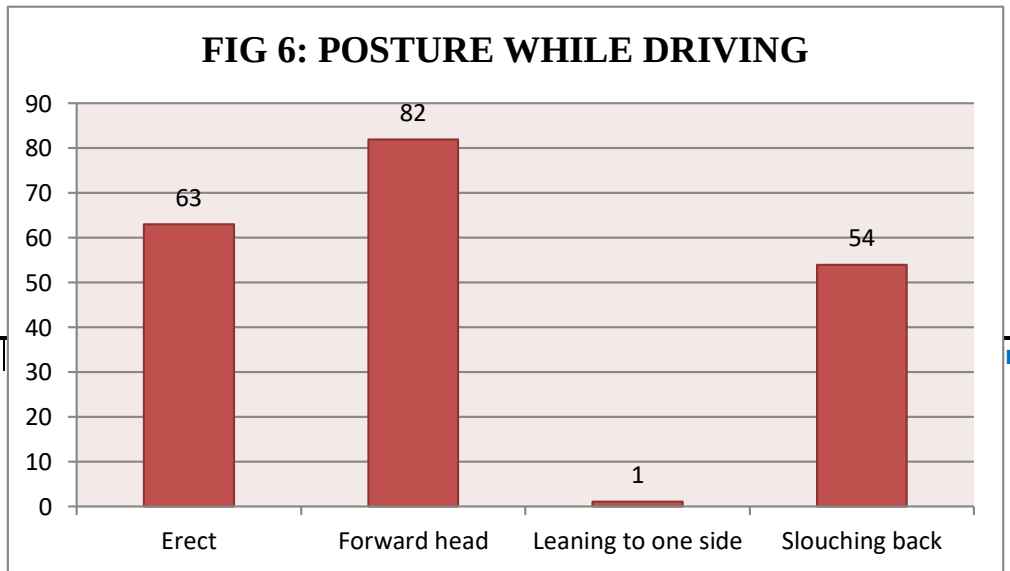


FIG 6: POSTURE WHILE DRIVING
90
80
70
60
50
40
30
20
10
0
63
82
1
54
Erect
Forward head
Leaning to one side
Slouching back

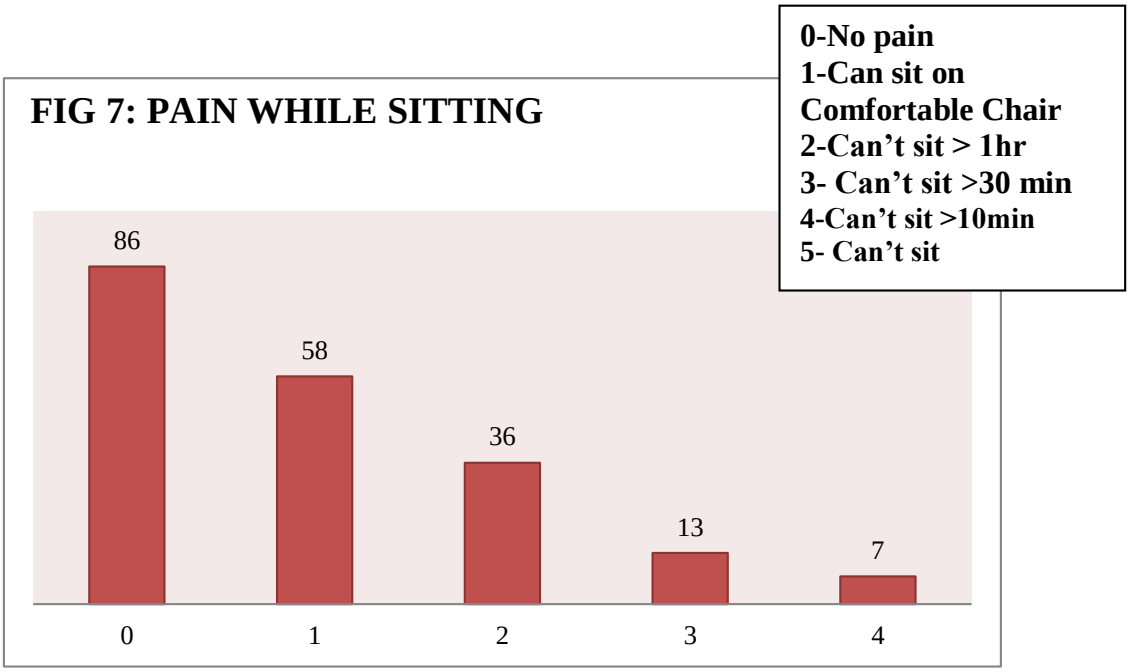


FIG 7: PAIN WHILE SITTING
0-No pain
1-Can sit on Comfortable Chair
2-Can't sit > 1hr
3- Can't sit >30 min
4-Can't sit >10min
5- Can't sit
86
58
36
13
7
0
1
2
3
4

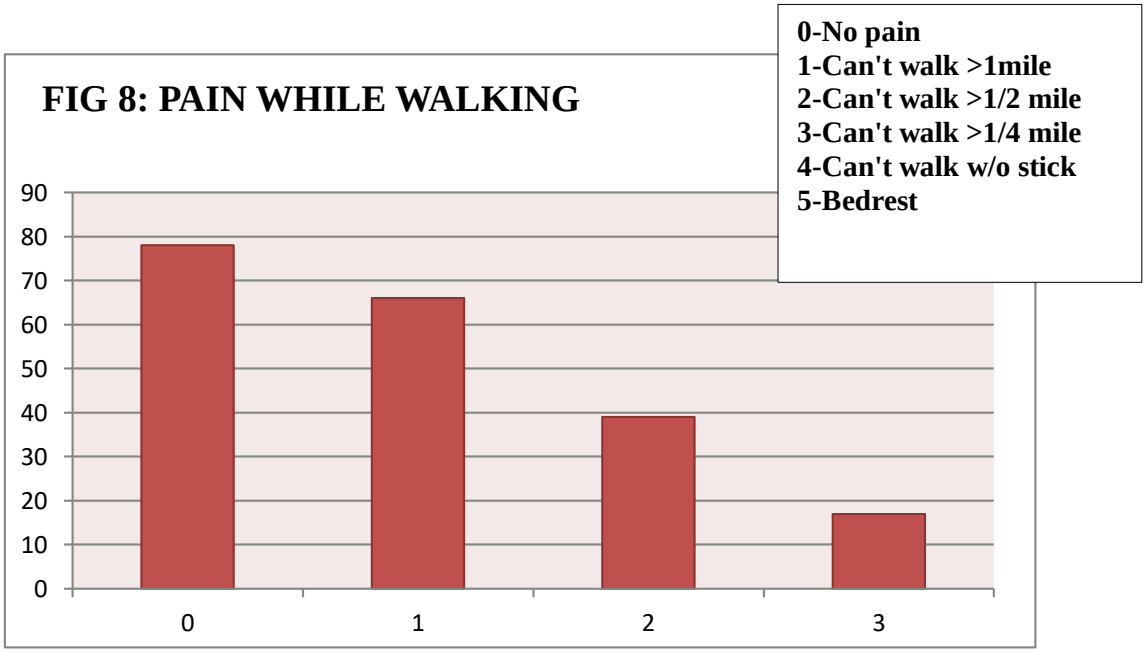


FIG 8: PAIN WHILE WALKING
0-No pain
1-Can't walk >1mile
2-Can't walk >1/2 mile
3-Can't walk >1/4 mile
4-Can't walk w/o stick
5-Bedrest
90
80
70
60
50
40
30
20
10
0
0
1
2
3

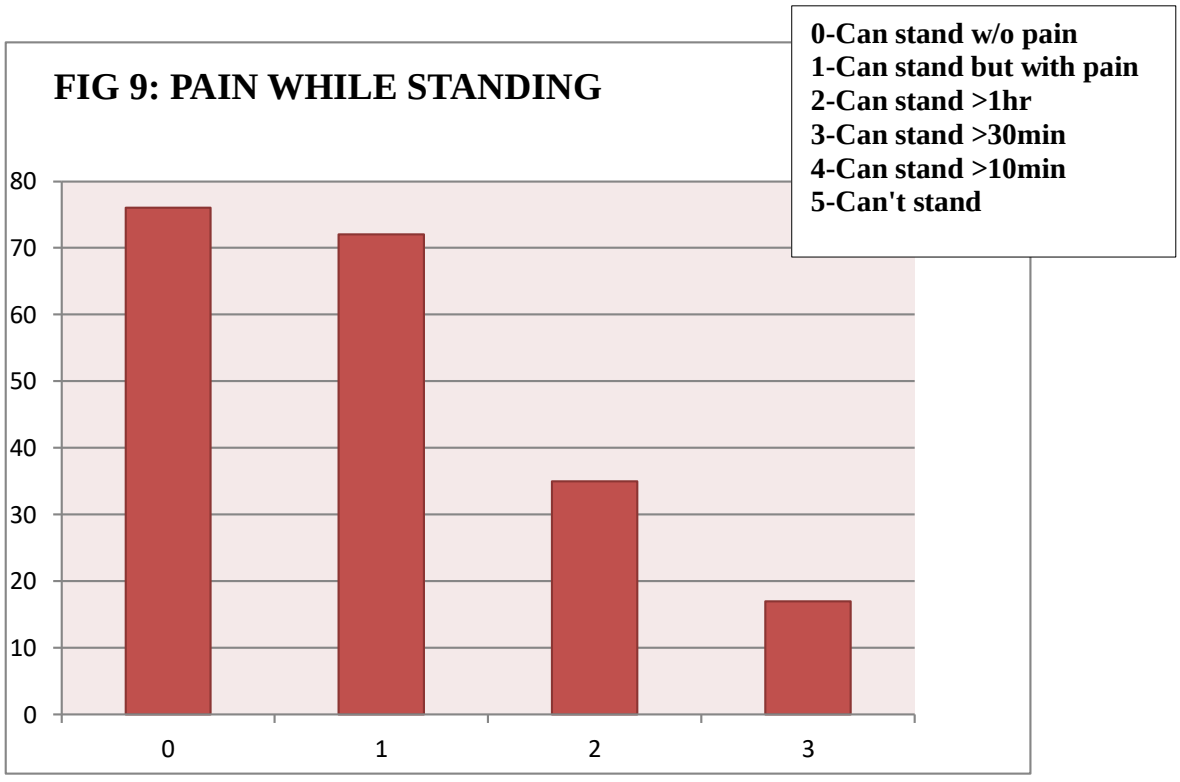


FIG 9: PAIN WHILE STANDING
0-Can stand w/o pain
1-Can stand but with pain
2-Can stand >1hr
3-Can stand >30min
4-Can stand >10min
5-Can't stand
80
70
60
50
40
30
20
10
0
0
1
2
3

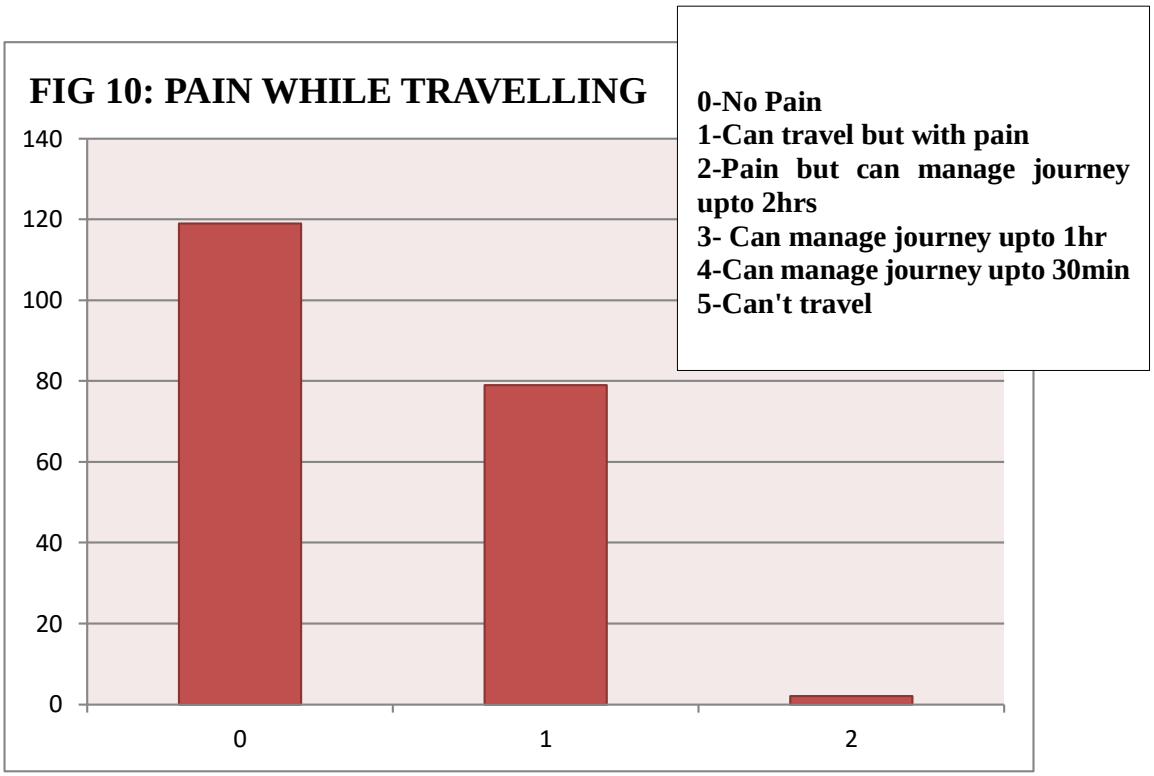


FIG 10: PAIN WHILE TRAVELLING
140
120
100
80
60
40
20
0
0
1
2
0-No Pain
1-Can travel but with pain
2-Pain but can manage journey upto 2hrs
3- Can manage journey upto 1hr
4-Can manage journey upto 30min
5-Can't travel

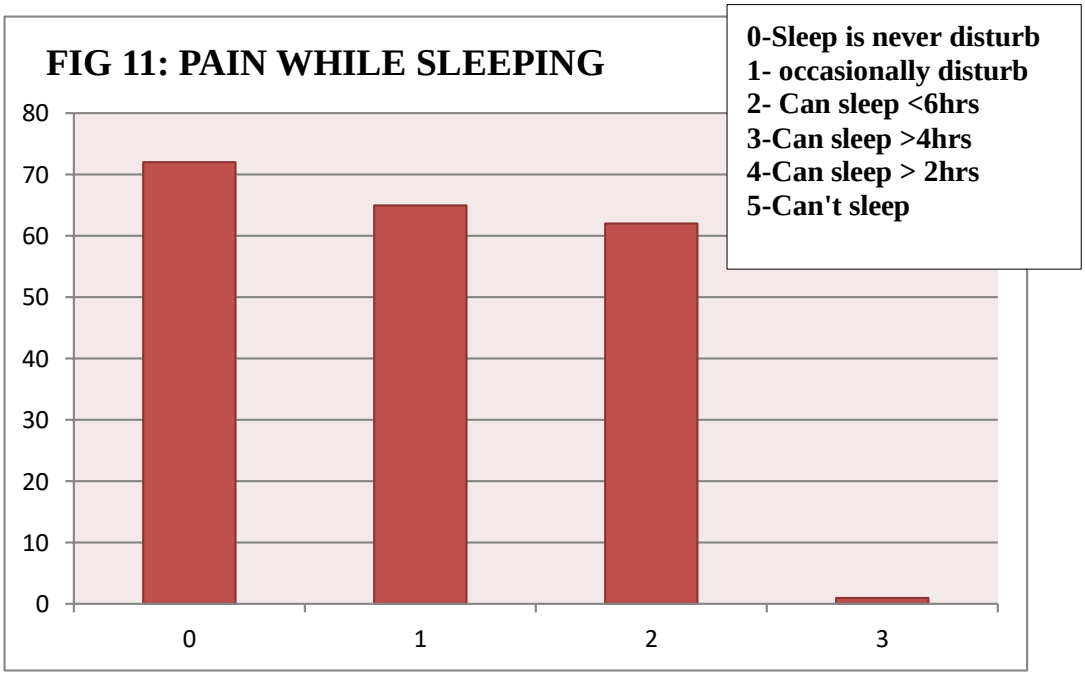


FIG 11: PAIN WHILE SLEEPING
80
70
60
50
40
30
20
10
0
0
1
2
3
0-Sleep is never disturb
1- occasionally disturb
2- Can sleep <6hrs
3-Can sleep >4hrs
4-Can sleep > 2hrs
5-Can't sleep

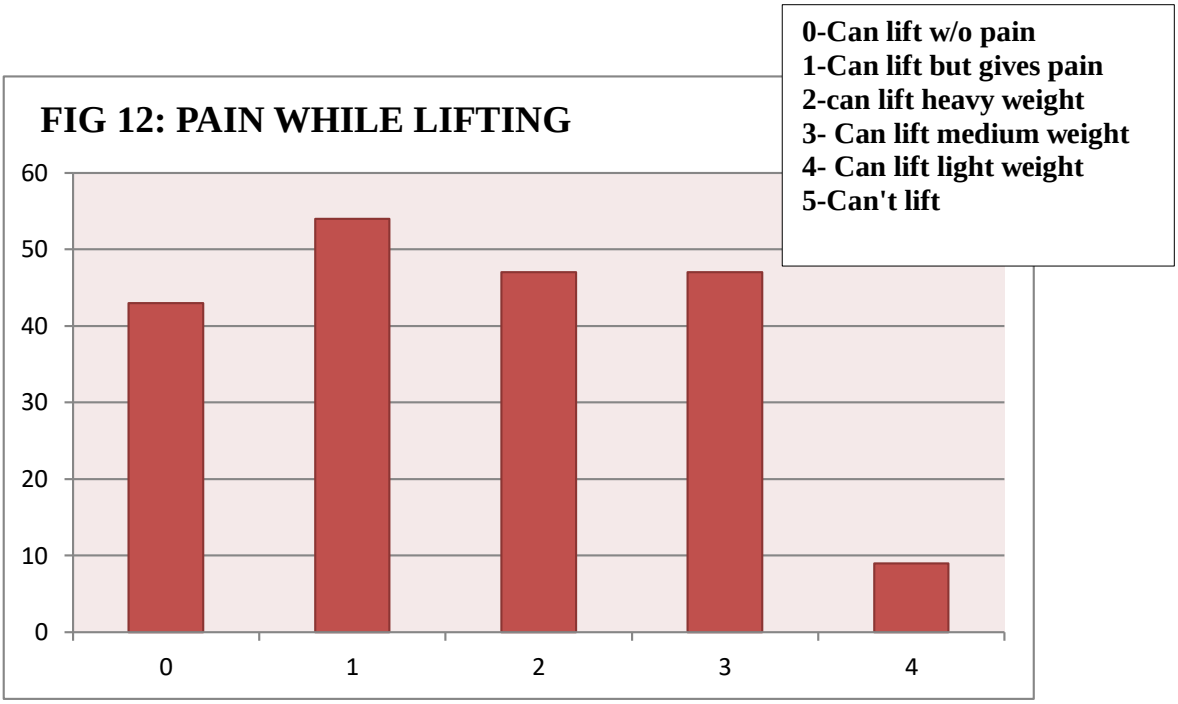


FIG 12: PAIN WHILE LIFTING
60
50
40
30
20
10
0
0
1
2
3
4
0-Can lift w/o pain
1-Can lift but gives pain
2-can lift heavy weight
3- Can lift medium weight
4- Can lift light weight
5-Can't lift

| FIG NO | NAME OF THE GRAPH | | RESULTS |
|---|---|---|---|
| 1 | RADIATING PAIN ( % OF PEOPLE HAVING RADIATING PAIN) | | |
| | A | YES | 41% |
| | B | NO | 59% |
| 2 | TIME OF DRIVING | | |
| | A | DAY | 51% |
| | B | BOTH | 49% |
| 3 | DURATION OF DRIVING | | |
| | A | 8 HOURS | 55% |
| | B | MORE THAN 8 HOURS | 45% |
| 4 | SEAT COMPACTIBILITY | | |
| | A | COMFORTABLE | 49% |
| | B | SATISFACTORY | 51% |
| 5 | PAIN INTENSITY | | |
| | A | NO PAIN | 6% |
| | B | MILD PAIN | 51% |

| | | | |
|---|---|---|---|
| | C | MODERATE | 33% |
| | D | FAIRLY SEVERE | 9% |
| | E | VERY SEVERE | 1% |
| | F | WORST | 0% |
| | | | |
| 6 | POSTURE WHILE DRIVING | | |
| | A | ERECT | 31% |
| | B | FORWARD HEAD | 41% |
| | C | SLOUCHING BACK | 27% |
| | D | LEANING TO 1 SIDE | 1% |
| | | | |
| 7 | SITTING | | |
| | A | 0-NO PAIN | 43% |
| | B | 1-CAN SIT ON COMFORTABLE CHAIR | 29% |
| | C | 2-CAN'T SIT > 1HR | 18% |
| | D | 3- CAN'T SIT >30 MIN | 6% |
| | E | 4-CAN'T SIT >10MIN | 4% |
| | | | |
| 8 | WAKING | | |
| | A | 0-NO PAIN | 39% |
| | B | 1-CAN'T WALK >1MILE | 33% |

| | | | |
|---|---|---|---|
| | C | 2-CAN'T WALK >1/2 MILE | 19% |
| | D | 3-CAN'T WALK >1/4 MILE | 9% |
| | | | |
| 9 | STANDING | | |
| | A | 0-CAN STAND W/O PAIN | 38% |
| | B | 1-CAN STAND BUT WITH PAIN | 36% |
| | C | 2-CAN STAND >1HR | 17% |
| | D | 3-CAN STAND >30MIN | 9% |
| | | | |
| 10 | TRAVELLING | | |
| | A | 0-TRAVEL W/O PAIN | 59% |
| | B | 1-CAN TRAVEL BUT WITH PAIN | 40% |
| | C | 2-PAIN BUT CAN MANAGE JOURNEY UPTO 2HRS | 1% |
| | | | |
| 11 | SLEEPING | | |

| | | | |
|---|---|---|---|
| | A | 0-SLEEP IS NEVER DISTURBED | 36% |
| | B | 1- OCCASIONALLY DISTURBED | 32% |
| | C | 2- CAN SLEEP <6HRS | 31% |
| | D | 3-CAN SLEEP >4HRS | 1% |
| 12 | LIFTING | | |
| | A | 0-CAN LIFT W/O PAIN | 21% |
| | B | 1-CAN LIFT BUT GIVES PAIN | 27% |
| | C | 2-CAN LIFT HEAVY WEIGHTS | 23% |
| | D | 3- CAN LIFT MEDIUM WEIGHTS | 24% |
| | E | 4- CAN LIFT LIGHT WEIGHT | 5% |
| 13 | INTERPRETATION OF SCORES | | |
| | A | MINIMAL LOW BACK DISABILITY | 0.50% |
| | B | MODERATE LOW BACK DISBILITY | 32% |

| | | |
|---|---|---|
| **C** | **SEVERE LOW BACK DISABILITY** | **7.50%** |
| **D** | **CRIPPLED** | **1%** |

| **INTERPRETATION OF DATA(ODI SCALE)** | | **PREVALENCE OF PIVD IN CAB DRIVERS** | |
|---|---|---|---|
| 0-20 | MINIMAL DISABILITY | 1 | 0.50% |
| 20-40 | MODERATE DISABILITY | 64 | 32% |
| 41-60 | SEVERE DISABILITY | 15 | 7.50% |
| 61-80 | CRIPPLED | 2 | 1% |
| 81-100 | | 0 | 0% |

FROM THE SAMPLE SIZE OF 200 WE HAVE FOUND THAT AROUND 41% OF THE CAB DRIVERS HAVE RADIATING PAIN.

AMONG WHICH 32% OF CAB DRIVERS ARE HAVING MODERATE DISABILITY,7.5%CAB DRIVERS HAVE SEVERE DISABILITY,1% ARE CRIPPLED AND 0.5% ARE AT MINIMAL DISABILITY RISK.

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# DISCUSSION

## DISCUSSION

In our study, prevalence rate of radiating pain was 41% among which 32% of cab drivers are having moderate disability it shows there is relation between cab drivers and PIVD the risk was identified among cab drivers on an average whose duration of driving was 8 hours or more than 8 hours and those who are driving from last 8-10years on an average.

In our study 51% of cab drivers were driving in daytime and 49% of cab drivers were driving during day and night both.

40% of drivers have travel difficulties due to pain,64% of drivers have sleep disturbances due to pain.

Almost all men in occupation involving professional driving had a statistically significant elevated risk of PIVD.

There are many limitations arise from factors such as the study design, the choice of sample population, sample size, type of question, response rate and large number of factors that can influence the backpain.

The reviewed studies mostly conclude that car driving is associated with increased risk of low backpain. Some studies have reported increased risk of low backpain with increased driving but no study shown that the risk of low backpain is greater with increased exposure to whole body vibrations from car driving.

In these cross sectional baseline study,45% of taxi drivers,53% of police drivers and 46% of police non-drivers reported experiencing low backpain for at least one day during the past

12 months (chi square test; p=0.09)

Chen JC et.al in this study the cross sectional analyses of data suggested that the urban taxi drivers were at high risk group for work related low backpain they observed association between long duration of car driving and low backpain conforms to previous studies on other occupational groups

often operating small auto mobiles. Found that driving a car or van for >4h/day was associated with a high prevalence of low backpain in past 12 months.[1]

27% of drivers has slouching back posture and 41% have forward head posture which further leads low backpain and neck pain respectively. Sitting for prolonged period of time can be major cause of backpain, because Sitting for prolonged periods of time can be a major cause of backpain, because increased stress of the back, neck, arms and legs and can add a tremendous amount of pressure to the back muscles and spinal discs. Additionally, sitting in a slouched position can overstretch the spinal ligaments and strain the spinal discs. When seated with a lumbar support, the intrinsic and abdominal muscles are no longer active. They cease to support your spine as it rests. Weight on each disc becomes uneven, and disc bulge occurs. The extrinsic and intrinsic muscles (which are smaller and shorter) become weaker and overstretched. Using the lumbar support found in all seats also reduces circulation to these muscles as person lay against them. Most of the people do not use seats upright properly, and over time, may slouch while seated. Here the pelvis develops a posterior tilt, leading to greater disc imbalance and risk or injury.

Placing arms and hands steering wheel, allows us to relax the upper body further. Relaxing exacerbates the curve in spine. Our natural and balanced lumbar S-shaped curve becomes a C-shaped curve. Other muscles like the abdominals and the transverse abdominals relax, resulting in less support. Hamstring and quadriceps muscles become progressively shorter (and weaker). The progression causes them to pull on the pelvis during activity, thereby reducing our pelvic mobility. The progression causes them to pull on the pelvis during

activity, thereby reducing our pelvic mobility. The inclination of the seat back to an angle of 100-110 is preferred as, this angle decreases the pressure on the discs in the low back. And in our study 61% of drivers was having difficulties while walking and 79% of them were having difficulties while lifting. The extensor muscles are attached to back of the spine. They enable standing and lifting objects. These muscles include the large paired muscles in the lower back, called erector spine, which help hold up the spine, and gluteal muscles. The flexor muscles are attached to the front of the spine and enable flexing, bending forward, lifting, and arching the lower back. The oblique

muscles are attached to the sides of the spine and help rotate the spine and maintain proper posture. Overusing, bad posture leads to malalignment of muscles which leads to inflammation in the muscle and then pain. Which results in activity limitations such as lifting heavy objects and walking. And 62% of drivers have pain on prolonged standing. The extensor muscles are attached to back of the spine. They enable standing and lifting objects. These muscles include the large paired muscles in the lower back, called erector spine, which help hold up the spine, and gluteal muscles. The flexor muscles are attached to the front of the spine and enable flexing, bending forward, lifting, and arching the lower back. The oblique muscles are attached to the sides of the spine and help rotate the spine and maintain proper posture. Overusing, bad posture leads to malalignment of muscles which leads to inflammation in the muscle and then pain. Which results in activity limitations such as lifting heavy objects and walking. The association between bending, twisting movements while behind the wheel and higher prevalence of LBP is also supported by recent reports from biomechanical experiments. Because LBP is such a common musculoskeletal disorder, it is possible that prolonged driving may not be an etiological factor but an occupational factor related to progression or recurrence of

existing LBP symptoms. High LBP frequency in taxi drivers was associated with prolonged driving time frequent bending, twisting activities while driving.

In this study Bovenzi et.al. a significant trend of increasing occurrence of disc protrusion was threefold higher among the tractor drivers compared with the controls. It has been reported that the professional drivers have an excess risk of herniated disc or rupture of annulus fibrosus.[2]

LBP has been identified as one of the costliest disorder in the worldwide population and activities such as sitting, whole body vibration and awkward postures have been associated with the risk of developing LBP. Uncomfortable seats, back support and gear level were observed to be associated with the higher prevalence of LBP.

Previous studies show that some type of car seats contribute to the development of LBP, particularly in people who drive for prolong period of time. The car seat and its backrest usually keeps the drivers hip in an angle of 90° or less, thus predisposing the lower lumbar disc to a great pressure: the

resultant forces subsequently contributes to injury of the low back and degeneration of lumbar spine. Additionally, sitting in a slouched position can overstretch the spinal ligaments and strain the spinal disc.

Study identified the duration of driving, type of seating posture, radiating pain and pain while doing any ADL (Activity of Daily Living) while driving as risk factors for PIVD among the cab drivers. Thus, our aim of study was to find out is there any relation between PIVD and cab drivers in Indian Cab Drivers. And our objective of the research which to analyses the prevalence of PIVD in cab drivers with LBP concludes that 41% of drivers had radiating pain among which 32% had moderate disability,7.5% had severe disability,1% were crippled and 0.5% had minimal disability.

# CONCLUSION AND SUMMARY

CONCLUSION: Study concludes that 41% drivers where having radiating pain among which 32% of drivers had moderate low back disability,7.5% had severe disability,1% were crippled and 0.5% had minimal low back disability resulting in hampering performance with the daily life activities and social life. Study identified the duration of driving and type of seating posture while driving as risk factors for low back pain which can further leads to PIVD among the participants.

## SUMMARY:

**TITLE:** Prevalence of Prolapsed Intervertebral Disc (PIVD) in Cab Drivers: A cross sectional study

**AIMS & OBJECTIVES:** To determine whether the PIVD is more prevalent in car drivers. To improve knowledge of cab drivers by making them understand about the proper ergonomics. To improve understanding of the risk factors which may contribute to the development or progression of the symptoms of PIVD.

**BACKGROUND:** Low backpain is very common and usually occupation related. This study aimed at determining the prevalence of PIVD in cab drivers by seeing at the low back disability index due to bad posture of sitting and duration of driving in the cab drivers.

**METHODOLOGY:** It is cross-sectional study in which 200 cab drivers has been screened for the presence of PIVD. 200 participants who was fulfilling the inclusive criteria has been taken. Then the researcher has explained about the research and the topic of research to the participants. Researchers has also explained about the PIVD, LBP which may further leads to PIVD and proper ergonomics while driving to prevent the PIVD. Participants with acute or sub-acute low back pain has been recruited. And their consent has been taken.SLR Special Test has been used to diagnose the PIVD. Then the researcher has explained about the special test and had performed it on the participant. If the test of a participant has been positive, he has been advised further for the radiological investigations to check the severity of the bulge and further the physiotherapy treatment has been provided to the participant.

**RESULT**: Total 200 patients were included in this study based on the inclusion and exclusion criteria. After filling the online consent form. Special test (SLR Test) is performed on the individual to diagnose the PIVD. Statistical analysis was done. All outcome measure(ODI) were analyzed at the end of study. After doing the pivot study on the collected data. We have found that around 41% of the cab drivers have radiating pain among which 32% of drivers had moderate low back disability,7.5% had severe disability,1% were crippled and 0.5% had minimal low back disability resulting in hampering performance with the daily life activities and social life. Study identified the duration of driving and type of seating posture while driving as risk factors for low back pain which can further leads to PIVD among the participants.

**KEYWORDS:** Low back pain, Cab drivers, Posture, Prolapsed Intervertebral Disc

# LIMITATIONS

## LIMITATIONS:

-Small sample size

-Only done in the particular area

## FUTURE RECOMMENDATIONS:

Future research should replicate these findings in other large samples, area and investigate between the other musculoskeletal problems related with driving.

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# ANNEXURE

## MASTER CHART

| **NAME** | Mukesh | Krishna | Ritesh | Ashok | Ajay | Dev | Raj | Deep |
|---|---|---|---|---|---|---|---|---|
| **AGE** | 47 | 27 | 46 | 51 | 36 | 41 | 39 | 55 |
| **PAIN INTENSITY** | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 1 |
| **RADIATING PAIN** | No | No | Yes | Yes | No | Yes | No | Yes |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **DURATION OF DRIVING** | 8 hours | More than 8 hrs. | 8 hrs. | 8 hrs. | More than 8 hrs. | 8 hrs. | More than 8 hrs. | 8 hrs. |
| **TIME OF DRIVING** | Day | Both | Day | Day | Both | Day | Both | Day |
| **SEAT COMPATIBILITY** | Comfortable | Satisfactory | comfortable | Comfortable | Satisfactory | Comfortable | Satisfactory | Comfortable |
| **POSTURE WHILE DRIVING** | Forward head | Erect | Slouching back | Forward head | Erect | Slouching back | Forward head | Erect |
| **PERSONAL CARE** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SITTING** | 2 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| **WALKING** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **STANDING** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **LIFTING** | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| **SLEEPING** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TRAVELLING** | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

## PATIENT INFORMATION FORM

Name:

Age:

Gender

- Male
- Female

Mobile Number:

Q.1 Pain Intensity

- No pain
- Mild
- Moderate
- Severe
- Very severe
- Worst

Q.2 Radiating Pain

- Yes
- No

Q.3 Duration of Driving

- 8 hours
- More than 8 hours

Q.4 Time of Driving

- Day

- Night
- Both

Q.5 Seat Compatibility

- Comfortable
- Satisfactory

Q.6 Posture while Driving

- Slouching back
- Forward head
- Erect
- Leaning to one side

Q.7 Personal Care (washing, Dressing etc.)

- I can look after myself normally without Causing extra pain
- I can look after myself normally but it causes extra pain
- It is painful to look after myself and I am slow and careful
- I need some help but manage most of my personal care
- I need help every day in most aspects of self-care
- I do not get dressed, I was with difficulty and stay in bed

Q.8 Sitting

- I can sit in any chair as long as I like
- I can only sit in my favorite chair as long as I like
- Pain prevents me sitting more than 1 hours

- Pain prevents me from sitting more than 30 minutes
- Pain prevents me from sitting more than 10 minutes
- Pain prevents me from sitting at all

Q.9 Walking

- Pain does not prevent me walking any distance
- Pain prevents me from walking more than 5 minutes
- Pain prevents me from walking more than 10 minutes
- Pain prevents me from walking more than 15 minutes
- I can only walk using a stick or crutches
- I am in bed most of the time

Q.10 Standing

- I can stand as long as I want without extra pain
- I can stand as long as I want but it gives me extra pain
- Pain prevents me from standing for more than 1 hours
- Pain prevents me from standing for more than 30 minutes
- Pain prevents me from standing for more than 10 minutes
- Pain prevents me from standing at all

Q.11 Lifting

- I can lift heavy weights without extra pain
- I can lift heavy weights but it gives extra pain
- Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently placed eg. On a table

- Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned
- I can lift very light weights
- I cannot lift or carry anything at all

Q.12 Sleeping

- My sleep is never disturbed by pain
- My sleep is occasionally disturbed by pain
- Because of pain I have less than 6 hours sleep
- Because of pain I have less than 4 hours sleep
- Because of pain I have less than 2 hours sleep
- Pain prevents me from sleeping at all

Q.13 Travelling

- I can travel anywhere without pain
- I can travel anywhere but it gives me extra pain
- Pain is bad but I manage journeys over 2 hours
- Pain restricts me to journeys of less than 1 hours
- Pain restricts me to short necessary journeys under 30 minutes
- Pain prevents me from travelling except to receive treatment

# CONSENT FORM

Subject's Name:

Age:

Address of the subject:

Investigators: YASH SHARMA

PRUTHVIBEN UPADHYAY

I have been explained regarding the research project entitled "PREVALENCE OF PROLAPSED INTERVERTEBRAL DISC (PIVD) IN CAB DRIVERS: A CROSS SECTIONAL STUDY" have been explained in details about the therapy which were given to me. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal right being affected. I understand that the data obtained through the study may be used for research paper publication and I also understand that my identity will not be revealed in any information released to third parties or published. I agree to take part in the above study.

Signature of the subject: ----------

Investigator Sign: ----------

Date: ----------

# SCALE

**Oswestry Low Back Pain Disability Questionnaire**

Section 1- Pain Intensity

- No pain
- Mild
- Moderate
- Severe
- Very severe
- Worst

Section 2- Personal Care (washing, dressing etc.)

- I can look after myself normally without Causing extra pain
- I can look after myself normally but it causes extra pain
- It is painful to look after myself and I am slow and careful
- I need some help but manage most of my personal care
- I need help every day in most aspects of self-care
- I do not get dressed, I was with difficulty and stay in bed

Section 3- Lifting

- I can lift heavy weights without extra pain
- I can lift heavy weights but it gives extra pain
- Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently placed eg. On a table
- Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned
- I can lift very light weights
- I cannot lift or carry anything at all

Section 4- Walking

- Pain does not prevent me walking any distance
- Pain prevents me from walking more than 5 minutes
- Pain prevents me from walking more than 10 minutes
- Pain prevents me from walking more than 15 minutes
- I can only walk using a stick or crutches
- I am in bed most of the time

Section 5- Sitting

- I can sit in any chair as long as I like
- I can only sit in my favorite chair as long as I like
- Pain prevents me sitting more than 1 hours
- Pain prevents me from sitting more than 30 minutes
- Pain prevents me from sitting more than 10 minutes
- Pain prevents me from sitting at all

Section 6- Standing

- I can stand as long as I want without extra pain
- I can stand as long as I want but it gives me extra pain
- Pain prevents me from standing for more than 1 hours
- Pain prevents me from standing for more than 30 minutes
- Pain prevents me from standing for more than 10 minutes
- Pain prevents me from standing at all

Section 7- Sleeping

- My sleep is never disturbed by pain
- My sleep is occasionally disturbed by pain
- Because of pain I have less than 6 hours sleep
- Because of pain I have less than 4 hours sleep
- Because of pain I have less than 2 hours sleep
- Pain prevents me from sleeping at all

Section 8- Travelling

- I can travel anywhere without pain
- I can travel anywhere but it gives me extra pain
- Pain is bad but I manage journeys over 2 hours
- Pain restricts me to journeys of less than 1 hours
- Pain restricts me to short necessary journeys under 30 minutes
- Pain prevents me from travelling except to receive treatment