



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

**IJDR**

*International Journal of Development Research*

Vol. 11, Issue, 07, pp. 49134-49137, July, 2021

<https://doi.org/10.37118/ijdr.22547.07.2021>



RESEARCH ARTICLE

OPEN ACCESS

## IMPACT OF HARMONIUM PLAYING ON NECK DISABILITY IN HARMONIUM PLAYERS

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### ARTICLE INFO

#### Article History:

Received 06<sup>th</sup> April, 2021  
Received in revised form  
19<sup>th</sup> May, 2021  
Accepted 03<sup>rd</sup> June, 2021  
Published online 30<sup>th</sup> July, 2021

#### Key Words:

Harmonium players,  
Neck disability.

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### ABSTRACT

**Background.** Performance related musculoskeletal pain and discomfort are prominent amongst musicians. Playing a harmonium requires muscle strength to play the instrument for hours and maintain the body posture for the same. This may make the musicians prone to neck pain and discomfort. Pain and discomfort are the problems that musicians face while playing the instrument. Adapted body posture while playing the instrument may lead to bad posture which may further increase pain in body parts like neck and back. **Purpose.** To find out the impact of harmonium playing on neck disability in harmonium players. **Methods.** The observational study consists of 114 participants, chosen according to inclusion and exclusion criteria and were given Neck Disability Index Scale and were asked to fill according to their condition. **Results.** The result showed that among the population of 114 individuals, 55% population was suffering from neck pain, 5.25% population had difficulty in personal care activities, 11.39% population had difficulty in lifting heavy objects, 53.47% population had difficulty while reading, 28.86% population suffered from infrequent headaches, 27.97% population had difficulty concentrating while playing, 37.67% population finds it difficult working at their work place, 27.9% population had difficulty in driving, 21.8% population had disturbed sleep, 13.97% population had difficulty in recreational activities. **Conclusion.** Study concludes that there is an impact of harmonium playing on neck disability in harmonium players.

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**Citation:** Ruchika S. Atram and Dr. Ruchita Killedar, 2021. "Impact of harmonium playing on neck disability in harmonium players", *International Journal of Development Research*, 11, (07), 49134-49137.

## INTRODUCTION

Playing harmonium requires maximum concentration both psychologically and physically. The player has to continuously push and pull the handle which is attached to the bellows to blow the air in it. Because of this, one hand of the player has to keep pushing and pulling the bellow while other hand has more precise activity of playing the keys. Strength of both the limbs are needed as the hand that handles the bellows gets resistance because of continuous pumping of air and the hand that play the keys has to move with fast, complex, repetitive finger and hand movements. The players have to sit for hours for a concert or practice that requires core and back muscles to maintain the body in that posture for several hours which may result in overuse of the muscle and even joint pain. Pain and discomfort are the problems that musicians face while playing the instrument. Adapted body posture while playing the instrument may lead to bad posture which may further increase pain in body parts like neck, upper and lower back and knees. Over practicing and performing for years and for a longer duration makes the joints even more prone to injuries. Due to repetitive period of pain and avoidance of bad body posture leads to chronic pain syndrome and also muscle tightness and hypomobility of the joints.<sup>[1]</sup>

Pain merely does not hamper their activities like maintaining personal hygiene but can affect other areas of life like concentrating while playing or reading and can slow down the individuals speed at his or her work place. Pain can also lead the individual to lose interest in his or her hobbies and may lead to headaches and disturbed sleep. It is important for the musicians to keep in check their musculoskeletal related problems as it will be helpful for them to figure out whether their instrument has a harmful impact on their body.

### Need of Study

While playing the harmonium both the hands have a different function. One hand holds the bellows which needs good strength of the muscles to move it while the other hand has more precise work for continuously moving the fingers on the keyboard. Over-practicing or over-performing for long period of time can therefore lead to neck pain due to continuous repetitive movements in an abnormal posture. The string players like guitarist can perform standing upright compensating for their posture but harmonium players have to sit in same position continuously for a long period of time leading to adapted posture while playing the instrument. Many studies have been carried out in the western countries in the past about playing related musculoskeletal disorders in musicians but very few studies

are done on Indian musicians specifically those playing harmonium. Therefore, the aim of the study is to screen the targeted population for neck pain which can be experienced due to their poor posture and long hours of playing and also to find other problems faced by them in daily life because of these symptoms so as to come up with interventions and practices to avoid the pain in the future.

**AIM:** To find out the impact of harmonium playing on neck disability in harmonium players using Neck Disability Index.

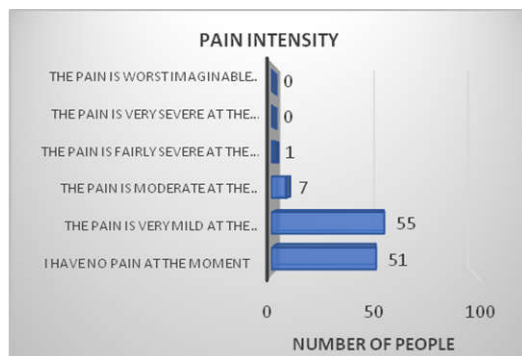
## METHODOLOGY

The observational study was performed on 114 individuals for a duration of 6 months using neck disability index scale in pimprichinchwad area.

**Inclusion and Exclusion Criteria:** The study included harmonium players, both male and female in the age group 18-50 years learning harmonium for more than 1 year. Individuals having recent upper limb injury, recent surgery, having neurological condition or on any medications for pain were excluded from the study.

## DATA ANALYSIS AND RESULTS

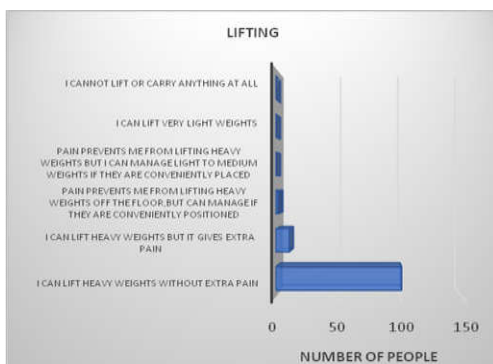
### Pain Intensity



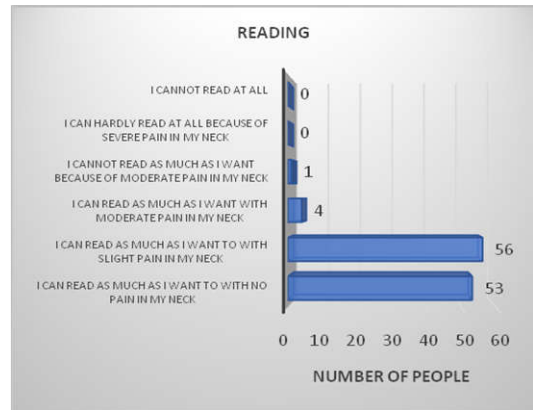
### Personal Care (Washing, Dressing, Etc.)



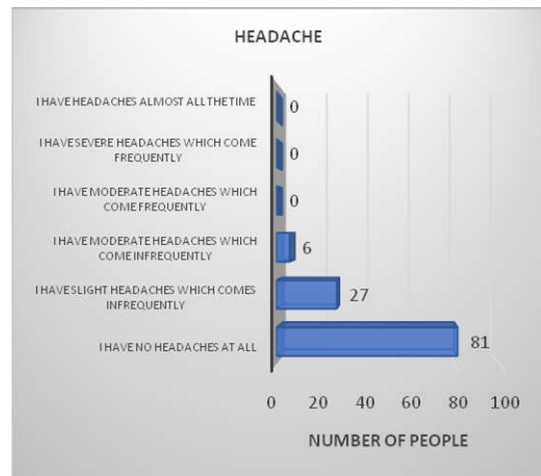
### Lifting



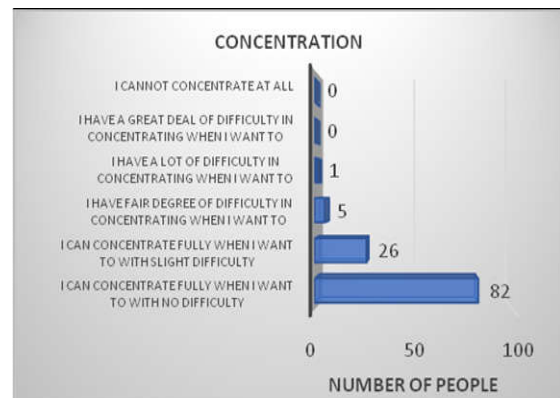
### Reading



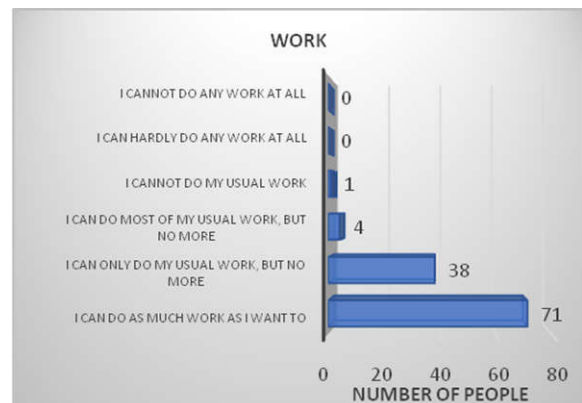
### Headache



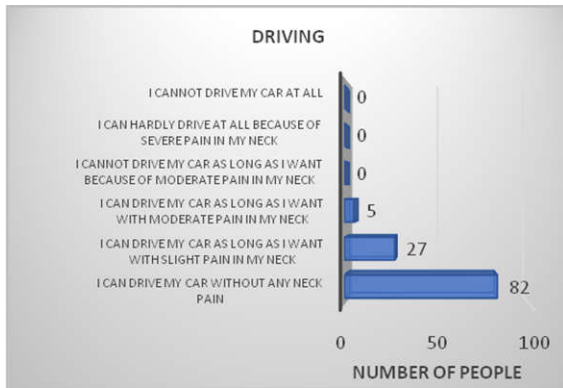
### Concentration



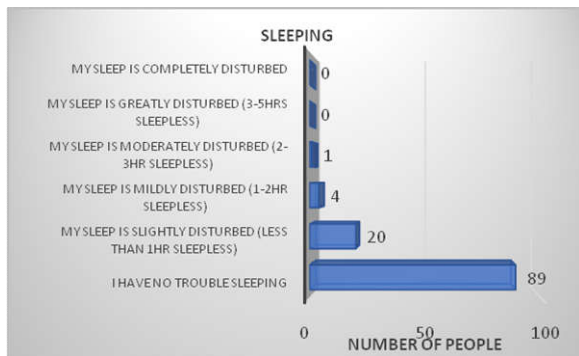
### Work



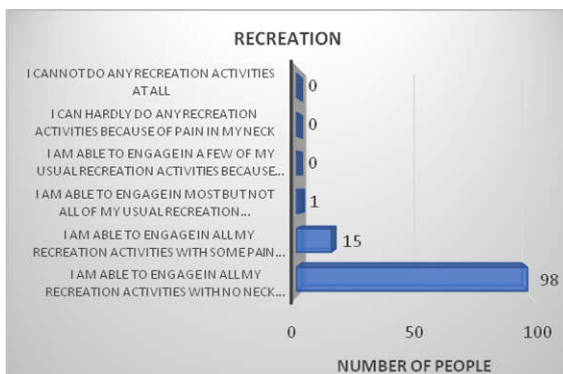
**Driving**



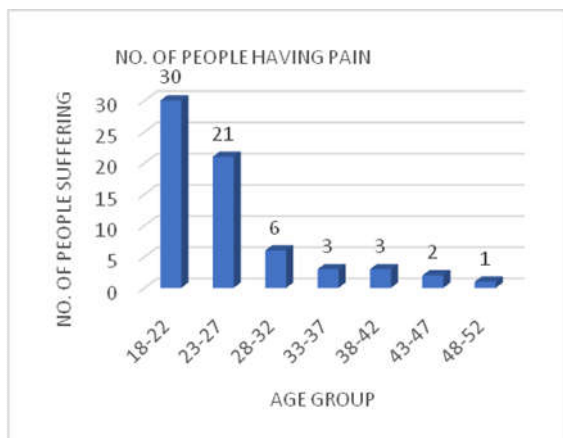
**Sleeping**



**Recreation**



**Age wise distribution of people having pain**



A sample size of 114 individuals were taken in this study, which include both male and female of age 18-50 years. NDI scale was taken on every individual. Based on statistical analysis:

**Graph 1:** shows that 44.7% population had no pain at the moment, 48.2% population had very mild pain at the moment, 6% population had moderate pain at the moment and 0.87% individual had fairly severe pain at the moment.

**Graph 2:** shows that 94.7% population can look after themselves without causing extra pain in the neck, 3.5% population can look after themselves normally but causes extra pain, 1.75% population find it painful to look after themselves and are slow and careful.

**Graph 3:** shows that 88.5% population can lift heavy weights without extra pain, 9.64% population can lift heavy weight but it gives extra pain and in 1.75% population pain prevents them from lifting heavy weights off the floor but can manage if they are conveniently positioned.

**Graph 4:** shows that 46.4% population can read without neck pain, 49.1% population can read with slight neck pain, 3.5% population can read with moderate neck pain, 0.87% population cannot read because of moderate neck pain.

**Graph 5:** shows that 71% population had no headaches at all, 23.6% population had slight headaches infrequently, 5.26% population had moderate headaches infrequently.

**Graph 6:** shows that 71.92% population can concentrate fully with no difficulty, 22.8% population can concentrate fully with slight difficulty, 4.3% population had fair degree of difficulty in concentrating, 0.87% population had a lot of difficulty in concentrating.

**Graph 7:** shows that 62.2% population can do as much work as they want, 33.3% population can do usual work but no more, 3.5% population can do most of their usual work but no more, 0.87% population cannot do their usual work.

**Graph 8:** shows that 71.9% population can drive without any neck pain, 23.6% population can drive with slight neck pain, 4.3% population can drive with moderate neck pain.

**Graph 9:** shows that 78.07% population had no trouble in sleeping, 17.5% population have slightly disturbed sleep, 3.5% population have mildly disturbed sleep, 0.87% population have moderately disturbed sleep.

**Graph 10:** shows that 85.96% population are able to engage in all activities without neck pain, 73.1% population are able to engage in activities with some pain in my neck, 0.87% population are able to engage in most but not all activities because of neck pain.

**Graph 11:** shows number of people suffering from neck pain between a particular age group:

- 18-22 years: 30 individuals
- 23-27 years: 21 individuals
- 28-32 years: 6 individuals
- 33-37 years: 3 individuals
- 38-42 years: 3 individuals
- 43-47 years: 2 individuals
- 48-50 years: 1 individual

**DISCUSSION**

This study aimed to find out the prevalence of Neck pain in harmonium players. While playing the harmonium, the player sits for hours. Both the hands of the musicians have different functions to play harmonium. Left hand for holding the bellows where more air pressure is required to produce good sound, so more muscle strength is required to pull the bellows while other hand has a faster and repetitive action of continuously moving the fingers on keyboard. Harmonium players have different way of playing the instrument.

Some place the harmonium in front while others place it on a side varying the sitting position and posture to play it. Every individual has their own style and habit of playing the instrument taught by their teacher. Harmonium players stay in a constant posture, to practice for long hours as well as during a long concert. The players sit in a crossed legged position with one upper extremity that holds the bellows in scapular elevation, shoulder flexion and medial rotation, elbow extension, wrist extension and fingers flexion for gripping the bellows. While the other extremity remains in slight shoulder depression, shoulder adduction and then abduction as the arm moves while playing the keys, elbow flexed to up to 90 degrees and fingers moving continuously to play the keys. The player bends in the direction of the harmonium with forward neck posture in order to reach the harmonium. Playing harmonium mainly involves upper back muscles like trapezius, levator scapulae, rhomboids major and minor which helps in scapular movements and neck flexors which helps in neck flexion. Scapular protractors, shoulder flexors and medial rotators act to hold the bellows and intrinsic muscles of the hand act during the repetitive pulling of bellows. For playing the keys there is continuous action of scapular depressors, shoulder abductors and adductors and intrinsic muscles of the hand.

The repetitive movement and over practising make the back, shoulder and neck more prone to fatigue and discomfort. As the technique and forward neck posture involved in playing the instrument requires more exertion and the unsupported sitting worsens the condition even more. The posture involving forward neck and shoulder elevation and depression creates more tension on the neck and thus resulting in pain. Musicians does not realise the effects of repetitive playing and rarely complains of physical discomfort and assumes it to occur for short period of time and tries to overcome it without any medical intervention. Over the period of time, they have learnt to adapt the posture without taking any measures to prevent it from further deterioration. In this study, the aim was to find the prevalence of neck pain in harmonium players through Neck Disability Index scale where subjects were asked questions according to the components of the scale. The overall study analyses that, among the population of 114 individuals, 55% population was suffering from neck pain at the moment, 5.25% population had difficulty in performing personal care activities, 11.39% population had difficulty in lifting heavy objects, 53.47% population had difficulty while reading, 28.86% population suffered from infrequent headaches, 27.97% population had difficulty concentrating while playing, 37.67% population finds it difficult working at their work place, 27.9% population had difficulty in driving, 21.8% population had disturbed sleep, 13.97% population had difficulty in performing recreational activities.

## Conclusion

We conclude that there is significant impact of harmonium playing on neck disability in harmonium players.

## Limitations of Study

- Small sample size was included in this study.
- Previous medical history of the individual was not taken into consideration.

## Future Scope of Study

- Study can be done in large population.
- Study can be performed to assess other playing related musculoskeletal disorders in harmonium players such as postural problems and strength.

- Study can be done for a longer duration of time.
- Study could be beneficial for those who want to learn harmonium or want to pursue their career in music.

## Clinical Implication

- Postural education and ergonomic advices should be explained to avoid pain, discomfort and faulty posture.
- Self-stretching exercises should be performed during the break to avoid muscle tightness and muscle spasm.
- Cervical and core muscle strengthening exercises could be taught to the amateur players before they start learning to play harmonium.

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