

**Research Article****Effects Of Wearing Headscarves On Cervical Spine Deficit Proprioception And Decreased Range Of Motion****¹Neelu Pawar, ²Shadma Siddiqui**¹Asso. Professor, Department of Physiotherapy,
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SAM Global University, Raisen, MP**Article information****ABSTRACT****Volume: 1****Issue: 1****Page No: 20-24****Received: 02.04.2024****Accepted: 10.4.2024****Published: 26.05.2024****DOI No.:****Corresponding Author:**Neelu Pawar, PT ,Asso. Professor,
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Mobile: +91-8770892577**Keywords:**Headscarves, Cervical, Mobility,
Proprioception , ROM

Cervical range of motion (ROM) is often used as a predictive outcome measure in the assessment of neck pain-related conditions. Cervical ROM refers to the degree of movement that occurs in the neck in different directions, including flexion (forward bending), extension (backward bending), lateral flexion (side bending), and rotation. The ability to integrate sensory signals from mechanoreceptors is crucial for determining body segment position and movement in space. Impairments in cervical mobility and proprioception have been reported in subjects with whiplash-associated disorder as well as subjects having neck pain. This study aim to assess out the Proprioception, Mobility of Cervical Spine after wearing Headscarves.

Methodology: The women selected for this study having age group of 18-40 age group. They directly Physiotherapy Clinics. Tenderness, Spam, Cervical spondylitis females are excluded. Patient are instructed to sit on a chair and all the movement of neck are assessed by Goniometer. while on other hand checking their propeption by giving commands.

Result: Females in the non-headscarf group had a significant reduction in CROM for right rotation 77.35 ± 1.23 , Left rotation 76.97 ± 1.48 , Flexion 42.4 ± 3.68 , Extension 40.17 ± 3.67 , Rt. Lateral Flexion 42.83 ± 3.09 , Lt. Lateral Flexion 43.43 ± 2.86 compare to wearing scarves.

INTRODUCTION

Cervical proprioception refers to the ability to sense the position and movement of the head in space, and it plays a crucial role in maintaining balance and coordinating movements. Wearing a Headscarf might potentially impact cervical proprioception due to the added weight, Pressure on the head and neck¹. Proprioception is a crucial aspect of sensorimotor control, governing the ability to perceive the position, movement, and orientation of one's body parts in space². It plays a fundamental role in maintaining posture, coordinating movements, and providing the necessary feedback to execute motor tasks accurately³. The soft tissue structures in the cervical spine include muscles, ligaments, tendons, and other connective tissues, all of which contribute to the stability and mobility of the neck. Injuries to these structures can occur due to various reasons, such as trauma (e.g., whiplash injuries from car accidents), overuse, poor posture, or degenerative conditions⁴. When soft tissues are injured, it can disrupt the normal functioning of the sensory receptors, particularly the muscle spindles, that play a key role in providing proprioceptive information. Muscle spindles are sensory receptors embedded within skeletal muscles that play a crucial role in proprioception by detecting changes in muscle length and sending signals to the central nervous system. The information provided by muscle spindles contributes to the awareness of body position and movement⁵.

Proprioception plays an important role in sensorimotor control of posture and movement. There is a high density of muscle spindles in the cervical spine muscles serving as primary receptors of proprioception Moreover, there are higher densities of muscle spindles in the deeper neck muscles and upper cervical spine

compared to the lower cervical spine. Injuries to cervical spine soft tissue structures can compromise proprioception and contribute to deficits in head and neck position sense. Impairments in cervical proprioception have been documented in subjects with whiplash-associated disorder (WAD), patients with age-related degeneration, and patients with articular diseases or spondylosis.

Wearing protective headgear has been shown to decrease active cervical ROM. McCarthy et al. studied the impact of wearing an American football helmet on active cervical ROM and found that wearing helmets significantly decreased cervical extension. Additionally, soft neck collars significantly reduce cervical spine rotation from 75.8° to 67.4° a change of 11% . Although it is not as rigid as a helmet or neck collar, headscarves may also provide resistance to cervical ROM. The headscarf is operationally defined as a scarf that wraps up over the head and around the neck. Females in Islamic cultures often wear the headscarf when they are in public and usually begin wearing it at the onset of puberty. According to the Pew Research Centre (2014), there are approximately 1.7 billion Muslims, and they constitute the second-largest religious group in the world. Moreover, Muslims are estimated to become the second-largest religious group in the United States of America by the year 2040.

METHODOLOGY

The patient is instructed to sit on a chair while placing the pair of forearms on the chair's side hands. Move the head up and down (Flexion and extension), side to side bending (Lateral Flexion) and rotate left and right slowly (Lateral Rotation) to the end range, while the physiotherapist evaluates the range of motion of the cervical joint before starting the movement and at end range, simultaneously with the help of Goniometer after instructed by Therapist to remove Helmet. While the

Photographs have been taken with their concern of patient ROM in all Directions initially and after removing the Helmet.

STATISTICAL ANALYSIS

To analyze the data Statistical Product and Service Solutions (SPSS) for Windows version 23.0 (IBM Corp., Armonk, New York). A sample size of 70 subjects was needed to obtain a medium effect. Data was summarized using frequencies and Gender for categorical variables and means \pm standard deviation (SD) for quantitative variables. The normality of the quantitative variables was examined using Kolmogorov-Smirnov and Shapiro-Wilk tests. The mean age and body mass index (Kg/m²) of females in the headscarf group and those in the control group were compared using an independent t-test. Mean outcome variables (cervical ROM right rotation, left rotation, flexion, extension, right lateral flexion, left lateral flexion) by time spent per day wearing the headscarf (≤ 4 hours versus > 4 hours). There is no relationship between cervical ROM measures and age at onset of wearing the headscarf, number of years worn, and hours per day spent wearing the headscarf were examined using the Pearson correlation test. The significance level was set at a p-value of less or equal to 0.05

RESULT

A total of 70 females with mean age 28.1 ± 3.1 years participated in the study. The distribution of age, body mass index (BMI) in Kg/m², and range of motion (degrees) was approximately normal. There was no significant difference in mean BMI between the headscarf and control groups (26.9 ± 5.3 vs. 27.4 ± 5.0 , $p = 0.73$) and hand dominance (right-handed (92.3%, $n=24$) in the headscarf group vs. (84.6%, $n=22$) in the control group; $p=0.33$). In the headscarf group, the mean age at onset of wearing the headscarf was 12.6 ± 1.6 years, the mean time spent per day wearing the headscarf was 7.0 ± 2.3 hours, and the mean number

of years worn was 15.5 ± 3.6 years.

There was a significant difference in mean \pm standard error (SE) in the range of motion in all directions between the two groups Table 1 and Table 2

Table 1: Mean (SE) and standard deviation of cervical ROM of non-Headscarf Group 1(N=35)

ROM	Gender	Frequency	Std. Deviation	Variance	Mean \pm Std.
Rt. Rotation	Female	35	1.23	1.51	77.35 ± 1.23
Rt. Lateral Flexion	Female	35	3.09	9.56	42.83 ± 3.09
Lt. Rotation	Female	35	1.48	2.21	76.97 ± 1.48
Extension	Female	35	3.67	13.5	40.17 ± 3.67
Flexion	Female	35	3.68	13.54	42.4 ± 3.68
Lt. Lateral Flexion	Female	35	2.86	8.19	43.43 ± 2.86

There was a significant difference in mean \pm standard error (SE) in range of motion in all directions (Table 1). Females in the non-headscarf group had a significant reduction in CROM for right rotation 77.35 ± 1.23 , Left rotation 76.97 ± 1.48 , Flexion 42.4 ± 3.68 , Extension 40.17 ± 3.67 , Rt. Lateral Flexion 42.83 ± 3.09 , Lt. Lateral Flexion 43.43 ± 2.86 .

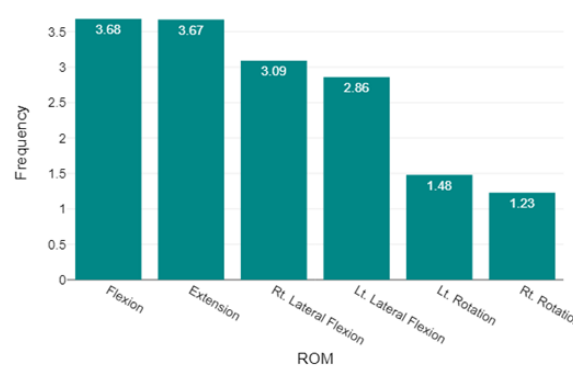
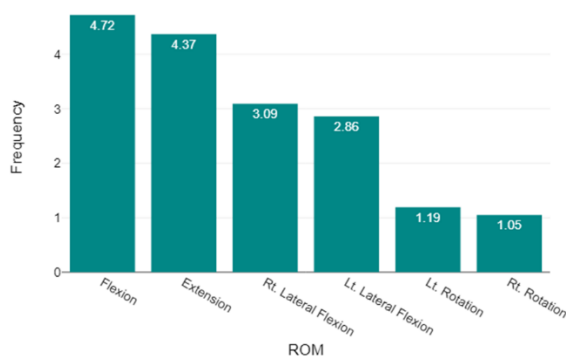


Table 2: Mean (SE) and standard deviation of cervical ROM of Control group headscarf group 2 (N=35)

ROM	Gender	Frequency	Std. Deviation	Variance	Mean \pm Std.
Rt. Rotation	Female	35	1.05	1.1	77.11 ± 1.05
Rt. Lateral Flexion	Female	35	3.09	9.56	42.83 ± 3.09
Lt. Rotation	Female	35	1.19	1.41	76.66 ± 1.19
Extension	Female	35	4.37	19.06	37.37 ± 4.37
Flexion	Female	35	4.72	22.3	41.77 ± 4.72
Lt. Lateral Flexion	Female	35	2.86	8.19	43.43 ± 2.86

Showing (Table 2) Significant difference in Rt rotation 77.11 ± 1.05 , Rt lateral flexion 42.83 ± 3.09 , Lt. Rotation 76.66 ± 1.19 , Lt. Lateral Flexion 43.43 ± 2.86 , Flexion 41.77 ± 4.72 , Extension 37.37 ± 4.37



The comparison of Table 1 and Table 2 shows, that after wearing a scarf there is a decrease in rotation in every direction. Implementing Repeated measures ANOVA to compare the deviation of both groups with age then the results showed, that there is a significant difference between ROM of both groups and Age. So it shows may be no significant difference in cervical spine mobility not wearing a Helmet.

	Type III Sum of Squares	df	Mean Squares	F	p	η^2
Treatment	4154.15	2	2077.08	3280.15	<.001	1
Error	6.33	10	0.63			

DISCUSSION

In this study, the differences in active cervical ROM between females who routinely wore the headscarf and females who never wore the headscarf were investigated⁶. The findings indicated that the headscarf group reported a significant limitation in cervical ROM in all four directions except right and left lateral flexion. Additionally, females in the headscarf group who wore the headscarf for four hours or more a day had significantly less left rotation compared to those who wore it for less than 2 hours a day. Podolsky

et al. State that Helmet use may have a notable impact on cervical range of motion, The duration of headscarf use over an extended period appears to be a significant factor influencing cervical ROM. It's important to consider these findings in the context of the study's methodology and population characteristics⁷. Dunleavy and Goldberg reported that erect posture is more likely to increase the amount of cervical ROM as compared to habitual posture. Since, in the current study, neither EMG nor postural analysis was assessed, this explanation needs to be explored in future studies. Neck proprioception plays an important role in postural control. Increased JPE has been reported in subjects with WAD⁸. Joint position error has also been reported in subjects with neck pain. Deficits in cervical proprioception as indicated by higher JPE might be a predisposing factor for development of cervical pain and dysfunction. In our study, subjects who wore headscarves showed to have higher JPE compared to those who did not wear them when moving their head in all directions (Table 2). Although this increase in JPE had a borderline significance, this difference may contribute

to maintenance of joint stability and thus may increase the risk of injury. Similar to this study, Sterling et al. (2003) reported a significant difference in JPE between subjects with traumatic neck pain compared with healthy control in right rotation only⁹. They concluded that the side of pain might contribute to this discrepancy because the majority of the subjects had bilateral involvement. Although hand dominance was not considered in their study, they speculated that it might explain their finding. Moreover, Treleaven et al. (2003) demonstrated a significantly higher joint position error in subjects with WAD

compared with healthy control in rotation and extension.¹⁰⁻¹³

CONCLUSION

The findings of this pilot study suggest that wearing headscarves can potentially influence head repositioning accuracy. Future research is needed to confirm these findings and should include larger sample size, age-matched control, blindfolding to minimize biofeedback, and inclusion of JPE with a range of motion measure

ACKNOWLEDGEMENTS

We are thankful to my beloved Parents, Guide and my colleagues for their assistance and guidance during my work.

CONFLICT OF INTEREST

The authors declare no conflicts of interest

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E-ISSN: Applied

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