"Cervical Range of Motion and Proprioception Due to Different Styles of Headscarf's Among LMDC Female Students"

Bisma Mujeeb
Physiotherapist (Gold medalist)
HS Health Group, Grimsby.
Email: Bismamujeeb904@gmail.com
00447716814323

Muhammad Nouman Tabassum
Assistant Professor, Lahore College of Physical Therapy, Lahore, Pakistan,
03336849593

Hafiz Muhammad Asim
Professor & Dean, Lahore College of Physical therapy, Lahore, Pakistan
03009400346

Shoaib Waqas
Associate Professor, Lahore College of Physical therapy, Lahore, Pakistan
03024552109

Hafiz Muhammad Uzair Asghar
Lecturer, Lahore College of Physical therapy, Lahore, Pakistan
0332-1666957

Maham Javaid
Demonstrator, Lahore College of Physical Therapy, Lahore, Pakistan
03366667318
maham.javaid11111@gmail.com (corresponding author)

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ABSTRACT:

Introduction:

Cervical Proprioception and range of motion (ROM) is measured by using Track laser and Goniometer among females who wear two different styles of head scarfs which is named as Amira and Keru dung. Females in Amira head scarf group had significantly less cervical proprioception and range of motion as compared to females in keru dung head- scarf group.

Objectives:

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To explore the cervical range of motion (ROM) and Proprioception due to different styles of head scarfs (Keru dung and Amira) among LMDC female students.

Methodology:

An analytical cross-sectional study was conducted.114 females who wear head scarfs was divided into two equal groups wearing amira and keru dung styles of head scarfs. Subjects were selected by using non-probability convenient sampling technique. All the subjects who wear

head scarfs were included in this study. Whereas subjects without head scarfs, have temporomandibular joint dysfunction or If they have had a recent episode of pain or trauma were excluded. The subjects were assessed for limited ROM and impaired proprioception by using goniometer for ROM and track laser for proprioception. The data was analyzed using statistical package for social sciences (SPSS) version 21. Descriptive statistics were noted and were displaced in the form of tabulations.

Results:

Our finding shows Amira style group reported a significant limitation in all cervical ROM in all six directions. Moreover, females in the Amira headscarf group who wore more than 7 hours/day had considerably less cervical left rotation and cervical flexion as compared to females in keru dung headscarf group. Joint Position Error (JPE) was measured using track laser for cervical flexion extension, cervical flexion, cervical extension, right rotation and left rotation in standing position. JPE test revealed significant difference between groups. Moreover, females in the headscarf group who wore Amira style and for more than seven hours per day had significantly less left rotation (.18279 vs .10746) as compared to those females who wear Keru dung style. Additionally, there was significant more JPE when relocating from extension compared to those who wear Keru dung style (.19796 vs .11954) respectively.

Conclusion:

The primary aim of present study was to investigate which style of headscarf is more suitable for women who wear regularly. So, that style fewer limits or hinder their ranges of cervical spine and proprioception as compared to other style which more prone to limit their ranges as well as their cervical proprioception during wearing them for prolonged working hours

Key words: *Cervical spine, range of motion, mobility, movement, Neck pain, hijab styles, headscarf's, headdress, proprioception, joint position error.*

INTRODUCTION:

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In Islamic culture, wearing of headscarf is a part of a requisite religious practice by our Islamic females. Basically, head scarfs operationally defined as a scarf that wraps up over the head and around the neck. In Islamic culture, female start to wearing the headscarf's at the onset of their puberty and wear when they are in public place (1). The cervical spine is distinctive in providing three dimensional movements of the head while maintaining the parallel of the visual gauze. At Cranio Cervical- junction, majority of movements occur which is distinctively adapted to stability and motion. (2). It has been documented that people with cervical spine pain reveal limited cervical ROM as compared to the people without any cervical spine pain (3). Proprioception is the unconscious perception of movements and spatial orientation arising from stimuli within the body itself. It plays an important role in sensory and motor control of posture and movements (4). Proprioception is defined as "the human being ability to integrate the sensory signals from mechanoreceptors to there by determine body segment position and movement in space". In cervical spine, high densities of muscle spindles are present in cervical spine muscles which serve as primary receptors of proprioception (5). These receptors have foremost connection with the visual and vestibular systems.

Furthermore, there are higher densities of muscle spindles in the deeper neck muscles and upper cervical spine compared to the lower cervical spine (6). Cervical proprioception impairments have been recognized in subjects with whiplash associated disorder (WAD), patients having degenerative 1problems, and patients having Spondylosis or articular disease (3, 7) It is extensively used to measure the head repositioning accurateness. The error is calculated by measuring the distance between the reference position and reproduced position and converting it to degrees. The JPE has well test- retest and inter-tester consistency (4).

After recent muscle history contraction, JPE was measured by Owens & Handerson in 2006. Their results showed a noteworthy undershooting after maximum voluntary contraction suggesting a probable mechanism of joint position error. Consequently, the purpose of my study is to investigate the impact of wearing different styles of headscarf's including AMIRA and KERADUNG on Cervical Proprioception and Range of motion and to compare the result of these two styles in LMDC females who regularly wear headscarf's so that we are able to know that which style more limit the cervical ROM and proprioception (7).

It has been reported that people with cervical spine report limited cervical ROM compared to people without cervical spine pain. Lee & Nicholson in 2005 also investigated that the ability to use active cervical ROM to distinguish between treated and untreated neck pain. Fifty-five individuals were divided into three groups: treated neck pain, untreated neck pain, and no neck pain. Individuals in the treated pain group reported more pain than individuals in the untreated pain group. The results indicated a reduction in head protraction range in the treated pain group as compared to the untreated pain group (8).

In addition, a considerable higher joint position error in subjects with WAD compared with healthy control in rotation and extension was verified by Treleaven in 2003. Their analysis exposed that WAD subjects with dizziness had considerable higher JPE in right

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rotation compared to WAD subjects without dizziness. Injuries' to cervical spine soft tissue structures can negotiation Proprioception and contribute to deficits in head and neck position sense (9).

Amira headscarf style is simple yet efficient two-piece head covering. It doesn't require pins. In this style, headscarf's wrapped tightly several times around your head and tucked snugly into a neck and drops it across your chest. In keradung style, drape a long rectangular scarf over your head with one side longer than the other. Pin up both sides of the scarf together under your chin. Flip the longer end of your scarf behind your opposite shoulder. Flip the same end back to the front of the other shoulder. Spread both the ends of your scarf so that they cover your chest.

The purpose of this study is to aware the females who regularly wore the head scarfs during their working hours about the style of head scarfs, which is more suitable for them to avoid limitation of their cervical ROM and their cervical proprioception.

MATERIALS AND METHODS:

SUBJECTS:

Data was collected from all the female students of Lahore medical and dental college (LMDC) wearing headscarf's for more than 7 hours. Female students who fall into the inclusion criteria were screened. Students joint position error test were assessed using head mounted laser. (4). It is widely used test to measure head position accuracy & The JPE has a good test-retest and inter test reliability (7). Cervical range of motion was assessed using Goniometry. A prior consent of all the participants was taken. Permission from the Ethics Committee of the LCPT was obtained. Performance was accompanied by an information sheet that explains the nature and purpose of the study, and explains that consent was taken from every student. The respondents were assured that their responses will remain confidential.

Sample size includes all the females of Lahore medical and dental college who wear head scarfs with the inclusion criteria of females wearing headscarf's, who wore scarfs wearing more than 7 hours a day and having age group of 18 to 24 with the exclusion criteria of females without headscarf's, cervical spondylosis due to trauma, balance problems due to any neurological conditions, semicircular canal problems due to any ENT condition, any other malignant disease present, temporal mandibular joint dysfunction, if they have had a recent trauma episode of pain and trauma and head tenderness.(10). Non - probability convenient sampling technique was used.

DATA ANALYSIS

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Data was entered by using Statistical Package for Social Sciences (SPSS) version 21 and the same software was used for data analysis. The study variables were presented in the form of descriptive statistics (tables)

RESULTS:

Goniometer was used to measure cervical mobility in a standing position for flexion, extension, right lateral flexion, left lateral flexion, right rotation and left rotation. The Amira style group reported a significant limitation in all cervical ROM in all six directions. Moreover, females in the Amira headscarf group who wore more than 7 hours/day had considerably less cervical left rotation and cervical flexion as compared to females in keru dung headscarf group. ***(Table No. 1)***

JPE was measured using track laser for cervical flexion extension, cervical flexion, cervical extension, right rotation and left rotation in standing position. JPE test revealed significant difference between groups. Moreover, females in the headscarf group who wore Amira style and for more than seven hours per day had significantly less left rotation (.18279 vs .10746) as compared to those females who wear Keru dung style. Additionally, there was significant more JPE when relocating from extension compared to those who wear Keru dung style (.19796 vs .11954) respectively. ***(Table no. 2)***

DISCUSSION:

Data was collected from all the female students of Lahore medical and dental college (LMDC) wearing headscarf's for more than 7 hours. Neck proprioception plays an important role in postural control. Increased JPE has been reported in subjects with WAD (11) Sterling reported a noteworthy difference in JPE between subjects with traumatic neck pain compared with healthy control in right rotation only. 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. (11). *Furthermore, Treleaven demonstrated a considerably higher joint position error in subjects with WAD compared with healthy control in rotation and extension. Their analysis revealed that WAD subjects with dizziness had significantly higher JPE in right rotation compared to WAD subjects without dizziness (9). Additionally, Kristjansson demonstrated a significantly higher a significant higher joint position error in subjects with neck pain compared to healthy control in rotation (12).*

Kasch prospectively investigated the ability of active cervical mobility, cervical pain, and non-pain complaints as a prognostic factor of handicap following whiplash injury. Subjects who had initial limitation in cervical ROM were 4.6 times at higher risk for disability following whiplash injury. Consequently, it was suggested that reduced cervical ROM is one the prognostic factors for increased disability after acute whiplash. Limited ROM is one of the prognostic factors for disability after acute whiplash (13).

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Wearing protective headgear has been shown to decrease active cervical ROM. McCarthy studied the impact of wearing an American football helmet on active cervical ROM and proprioception. Fifteen American football player with their age matched control participated. Cervical ROM and head reposition accuracy were measured during cervical flexion and extension. The results indicated that wearing the helmet significantly decreased cervical extension in both groups (14). Head repositioning accuracy was similar between the groups without the helmet. Though, when wearing the helmet American football players appeared to be more accurate in head repositioning accuracy than controls. Furthermore, soft neck collars considerably reduced cervical spine rotation (15).

Moreover, Dall'Alba examined the ability of cervical ROM to differentiate between asymptomatic subjects and those with persistence whiplash associated disorders (WAD). The finding indicated that cervical ROM effectively distinguishes between subjects with WAD and an asymptomatic control group. Hence, it was proposed that cervical ROM could be used as an indicator of physical impairments (16). Alqabbani in their study, all measurements of cervical ROM were performed without headscarf's. In contrast to our study; all measurements of cervical ROM were performed with head scarfs. All the measurements of cervical ROM were performed without the headscarf but in contrast to our study, all the measurements of cervical ROM were performed with headscarf's. This discovered significantly decrease in all ranges with headscarf's. The previous study performed all measurements in sitting position however; in our study we take all the measurements in standing position. There is also a link between style of headscarf use and cervical proprioception. He found a trend towards greater cervical joint position error in females who wore headscarves compared to those females who did not wear headscarves. In contrast to our study, we compare the female groups both wear headscarves but styles of headscarves were considered in our current study (17).

In our study, the main focus is on the styles of headscarf which are usually used in our society. Although this increase in JPE may contribute to maintenance of joint stability and thus may increase the risk of injury. Similar to this study, Alqabbani reported a significant difference in cervical right rotation and in cumulative position. Additionally, they reported less cervical left rotation range as compared to females who did not wear the headscarf (17). In contrast to previous study by Alqabbani, in which they performed the JPE test in sitting position. Moreover ,we blindfold subjects throughout the entire procedure to minimize potential biofeedback and learning effect as described in a previous study (4).

To the best of our knowledge, no previous investigations into the effect of different styles of headscarf's wearing regularly during working hours for prolonged time on cervical spine ROM and proprioception have been conducted. Therefore, the primary aim of present study was to investigate which style of headscarf is more suitable for women who wear regularly. So, that style fewer limits or hinder their ranges of cervical spine and proprioception as compared to other style which more prone to limit their ranges as well as their cervical proprioception during wearing them for prolonged working hours. Moreover, to maintain cervical mobility, performance

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of regular range of motion exercises is recommended, especially for females whose daily routines require them to wear the head scarfs for more than seven hours.

CONCLUSION:

The primary aim of present study was to investigate which style of headscarf is more suitable for women who wear regularly. So, that style fewer limits or hinder their ranges of cervical spine and proprioception as compared to other style which more prone to limit their ranges as well as their cervical proprioception during wearing them for prolonged working hours. Results show the correlation between cervical spine ROM and proprioception. Wearing that style of headscarf (Amira) which tightly ties over the neck might hinder full cervical ROM and might be the reason for impaired JPE as compared to females who loosely tie the headscarf's (keru -dung) around the neck.

Participants consent and ethical consideration:

Participants were knowledgeable about the aims & objectives of the study was observed by all individuals and consent form in the written form was obtained.

Consent for research publication

Individuals were familiar about the aims of the research and informed written statement and consent was taken.

Competing interests

There is no competing interest as declared by the author. The results of the research are obtained clearly, fairly, and without assembly, distortion, or misleading data maneuvering.

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Table no.1: T test to compare the cervical ROM

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	two different hijab styles (AMIRA,KERUDUNG)	Mean+ standard deviation	P -value
range of motion of cervical flexion	amira	54.1228+6.75614	.000
	Keru dung	67.7193+8.07720	.000
range of motion of cervical extension	amira	48.8596+5.82617	.000
	Keru dung	62.6316+4.73449	.000
range of motion of right cervical lateral flexion	amira	27.3684+5.18456	.000
	Keru dung	42.6316+2.51873	.000
range of motion of left cervical lateral flexion	amira	27.8070+5.42954	.000
	Keru dung	41.0526+2.94849	.000
range of motion of right cervical rotation	Amira	62.1053+7.90272	.000
	Keru dung	82.6316+5.83289	.000
range of motion of left cervical rotation	Amira	63.1579+8.64124	.000
	Keru dung	82.1053+4.99530	.000

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Table.2: T test for proprioception

	two different hijab styles (AMIRA,KERUDUNG)	Mean+ standard deviation	p-value
proprioception of cervical flexion	Amira	6.1747+1.21453	.000
	Keru dung	2.1204+.70572	.000
proprioception of cervical extension	Amira	6.0765+1.38004	.000
	Keru dung	2.1467+.81130	.000
proprioception of right cervical rotation	Amira	6.3730+1.29233	.000
	Keru dung	1.9439+.81526	.000
proprioception of left cervical roration	Amira	6.2351+1.49457	.000
	Keru dung	1.9340+.90252	.000

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