



## Effect of Donning Headscarf on Dynamic Balance in Young Females

Aatika Khan<sup>1</sup>, Nahid Khan<sup>2</sup>, Sohrab A Khan<sup>3\*</sup>

<sup>1</sup>MPT, Musculoskeletal, Jamia Hamdard University, New Delhi, India.

Email: aatika10yzai@gmail.com

Orcid ID: 0000-0002-3481-6257

<sup>2</sup>Assistant Professor, Jamia Hamdard University, New Delhi, India.

Email: nahid0409@gmail.com

Orcid Id: 0000-0002-3130-1899

<sup>3</sup>Associate Professor, Jamia Hamdard University, New Delhi, India.

Email: sohrab18sep@gmail.com

Orcid ID: 0000-0002-6766-4851

\*Corresponding author

### Abstract

**Background:** The present study will help to determine if balance in young females is affected due to donning of headscarf and will help in planning preventive strategies. **Material & Methods:** Study Design- Cross sectional study design, Setting- Subjects were selected from Jamia Hamdard, New Delhi -110062. Subjects were selected for the study according to the following inclusion and exclusion criteria. Methods of Sampling- Sample of convenience. Instrumentation/Tools/Scales- Goniometer, Standardized tape measure, Weighing machine, Stadiometer and Y Test Kit. Statistical Analysis-The data was managed on an excel spreadsheet and was analysed using SPSS (Statistical Package for Social Sciences for windows) software, Version 20. Student's t-test was used to analyse the data and level of significance was kept at 0.05.

**Results:** The purpose of conducting this study was to find out the effect of wearing head scarf on dynamic balance, which was conducted on females of Jamia Hamdard. This study was conducted on 98 young adult female university students. Out of which 49 subjects wore headscarf (Experimental group) for at least 1-year and rest 49 subjects did not wear a headscarf (Control group) It was observed that there was a statistically significant effect of wearing headscarf on dynamic balance in young adult females between the two groups. **Conclusion:** The present study was conducted to see the effect of donning a headscarf on balance in young females. A total of 98 subjects were included in the present study and divided into the control and experimental group. The results of the study indicated that the control group had better balance as compared to the experimental group by Y balance test indicating that donning of headscarf affects balance in young females. Hence null hypothesis is rejected and experimental hypothesis is accepted.

Received: 16 October 2022

Revised: 24 November 2022

Accepted: 05 December 2022

Published: 22 December 2022

**Keywords:-** Balance, headscarf, hijab, hooded scarf garment, cervical ROM, Y Balance test.

## INTRODUCTION

Balance is considered a key component in many activities of daily living, from simple activities such as quiet standing, to more complex activities such as walking while talking or while changing directions. There are two kinds of

balance: static and dynamic. Static balance is the ability to maintain an upright posture and to keep the line of gravity within the limits of the base of support (i.e., quiet standing). Dynamic balance is the ability to maintain stability during weight shifting, often while changing the base of support. Factors that influence balance

include sensory information obtained from the somatosensory, visual, and vestibular systems and motor responses that affect coordination, joint range of motion (ROM), and strength. This simple view of a balance system is quite limiting and can partially account for our limited abilities to assess risks of falling accurately, to improve balance and to reduce falls.<sup>[1]</sup>

A hooded scarf garment, comprising a neck portion having a top side, a bottom side, a front side removably secured about a user by a securement means, and a back side, said neck portion adapted to fit around a user's neck and upper shoulders.<sup>[2]</sup>

Restrictive clothing like hooded garments or head scarves may impair balance and may put people wearing them at higher risk of slipping and falling.

Disorders of the cervical spine often change the normal active range of motion (AROM) of the neck. The response of a patient with neck pain to therapeutic intervention is often recorded clinically by measuring or visually estimating changes in the AROM of the cervical spine. The full-circle goniometer, or universal goniometer (UG), is a versatile device for recording measurements of peripheral joint ROM in healthy subjects and in patients.<sup>[3]</sup>

Hijab is a type of headscarf worn by many Muslim girls and women beyond puberty in the presence of those outside their immediate families in conforming to a moral standard of modesty and privacy. The headscarf can be made from a variety of fabrics, adorned to cover the entirety of the hair, neck, and sometimes chest and is usually secured in place by a safety or straight pin under the chin or at the vertex to

prevent exposure of these areas. Long hair may be tied in a bun or ponytail underneath the hijab. Regular wearing of headscarf might have an influence on neck range of motion, neck proprioception and balance.

Hence, present study was done to see if donning a headscarf affects balance in young female.

## MATERIAL AND METHODS

This includes information regarding subjects, instrumentation and procedure used.

**Sample Size:** Total of 49 young adult female subjects were selected in the study who wore headscarf.

**Source of Subjects:** Subjects were selected from Jamia Hamdard, New Delhi -110062

### Method of Selection

Subjects were selected for the study according to the following inclusion and exclusion criteria.

### Participation Criteria

#### Inclusion Criteria

- Age: 18-24 years
- Females wearing headscarf for a minimum duration of 1 year.

#### Exclusion Criteria

- No history of orthopaedic, neurological or vestibular disease
- Female athletes or female engaged in regular fitness program

### Methods of Sampling

Sample of convenience



## Study Design

Cross sectional study design

## Instrumentation/Tools/Scales

- Goniometer
- Standardized tape measure
- Weighing machine
- Stadiometer
- Y Test Kit

## Procedure

Subjects were taken from Jamia Hamdard, girls' hostel respectively. They were selected based on the inclusion and exclusion criteria. Inform consent and baseline assessment were taken from the subject. They were asked to perform cervical ROM (Flexion, Extension, Rotation, Lateral Flexion) and the ranges were measured using a goniometer. Subjects were asked to perform dynamic balance (Y test). Readings were taken and then tabulated in the form of master chart. Data analysis was done. Result was discussed.

## Statistical Analysis

The data was managed on an excel spreadsheet and was analysed using SPSS (Statistical Package for Social Sciences for windows) software, Version 20. Student's t-test was used to analyse the data and level of significance was kept at 0.05.

## RESULTS

The purpose of conducting this study was to find out the effect of wearing head scarf on dynamic balance, which was conducted on females of Jamia Hamdard. This study was conducted on 98 young adult female university students. Out of which 49 subjects wore headscarf (Experimental group) for at least 1-year and rest 49 subjects did not wear a headscarf (Control group). It was observed that there was a statistically significant effect of wearing headscarf on dynamic balance in young adult females between the two groups.

**Table 1:** Demographic data: depicting the mean and standard deviation in age and BMI of subject population in different groups

	AGE (years)		BMI (kg/m <sup>2</sup> )	
	MEAN	SD	MEAN	SD
Group A	21.10	1.295	21.97	3.396
Group B	21.61	1.272	22.71	4.399

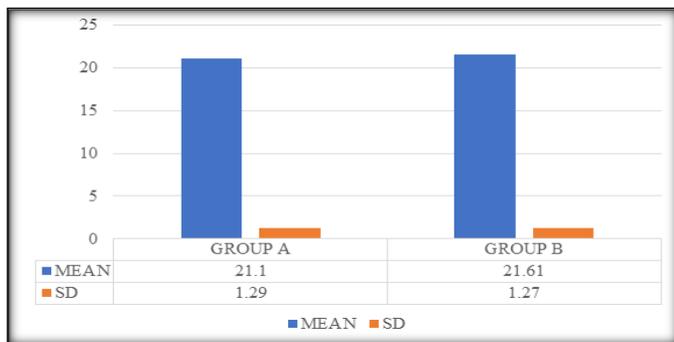
**Table 2:** Table depicting mean, standard deviation, t-score and p-value of Y BALANCE TEST of Group A and B

Group A	Group B		t – score	p value		
	Mean	SD			Mean	SD
COMPOSITE YBTR	82.87	14.299	90.72	12.25	-2.91	0.04
RIGHT AT	79.39	12.42	80.19	11.83	-0.328	0.74
RIGHT PL	66.5	11.78	79.75	14.65	-4.93	0.00
RIGHT PM	71.36	13.55	79.75	14.65	-3.149	0.02

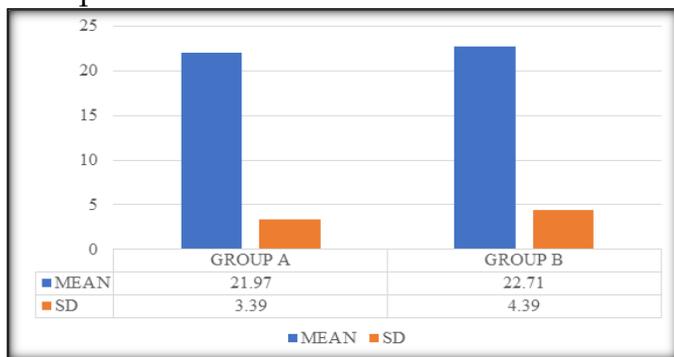
COMPOSITE YBTL	84.73	12.84	90.89	14.07	-2.26	0.026
LEFT AT	77.92	13.96	76.47	16.27	0.475	0.63
LEFT PL	65.56	12.05	75.95	15.4	-3.71	0.00
LEFT PM	69.04	14.39	72.11	13.46	-1.09	0.27

**Table 3:** Table depicting mean, standard deviation, t-score and p-value of CERVICAL RANGE OF MOTION of Group A and B

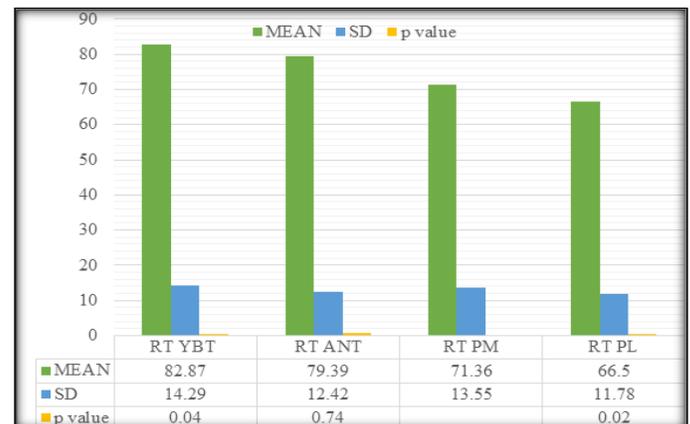
Group A	Mean	SD	Group B	Mean	SD	t-score	p-value
CERVICAL FLEXION	46.43	10.41	45.83	8.89	0.308	0.759	
CERVICAL EXTENSION	51.48	7.68	51.34	7.78	0.091	0.927	
CRR	62.38	7.23	61.63	7.63	0.502	0.616	
CLR	61.97	8.92	61.24	8.90	0.408	0.684	
CRLF	36.46	5.56	37.04	5.68	-0.503	0.616	
CLLF	34.73	5.90	36.84	9.39	-1.33	0.186	



**Figure 1:** Graph representing the comparison of mean age of subjects among Group A and Group B



**Figure 2:** Graph representing the comparison of mean BMI of subjects among Group A and Group B



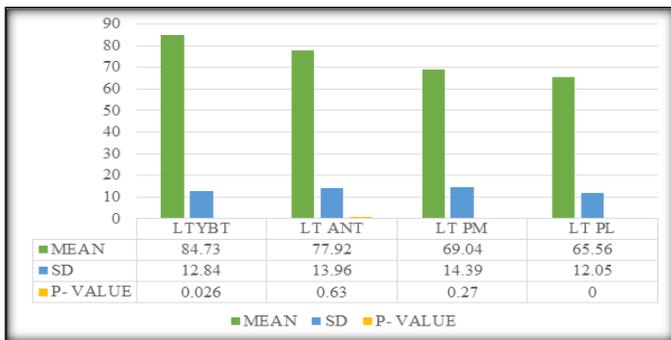
**Figure 3:** Graph depicting mean, standard deviation, p-value of right-side Y BALANCE TEST of Group A

### Demographic Data

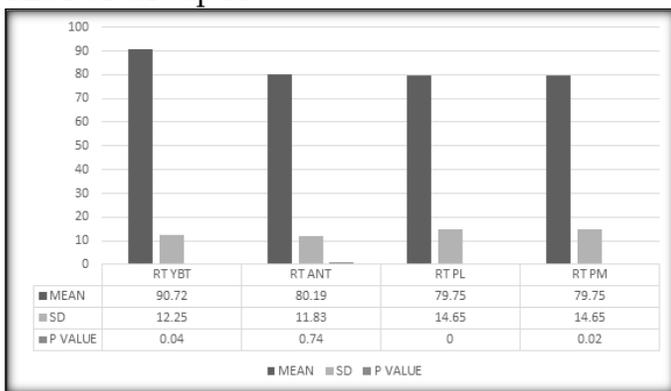
A total of 98 subjects were included in the study according to the inclusion criteria.

Group A(Experimental) had 49 subjects with mean age 21.10 with a standard deviation of 1.295

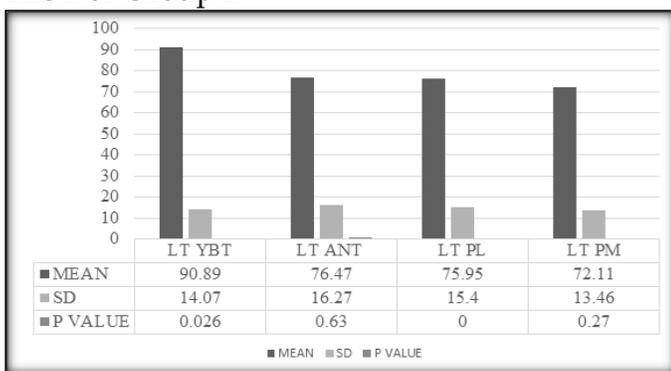
Group B(Control) had 49 subjects with mean age 21.61 with a standard deviation of 1.272.



**Figure 4:** Graph depicting mean, standard deviation, p-value of left side Y BALANCE TEST of Group A



**Figure 5:** Graph depicting mean, standard deviation, p-value of right-side Y BALANCE TEST of Group B



**Figure 6:** Graph depicting mean, standard deviation, p-value of left side Y BALANCE TEST of Group B

The mean for flexion for Group A is 46.43 with standard deviation of 10.41 whereas for Group

B it is 45.83 with standard deviation of 8.89. The t-score came out to be 0.30 showing non-significance statistically with a p-value of 0.75. The mean for extension for Group A is 51.48 with standard deviation of 7.68 whereas for Group B it is 51.34 with standard deviation of 7.68. The t-score came out to be 0.30 showing non-significance statistically with a p-value of 0.92.

The mean for right rotation for Group A is 62.38 with standard deviation of 7.23 whereas for Group B it is 61.63 with standard deviation of 7.63. The t-score came out to be 0.50 showing non-significance statistically with a p-value of 0.61.

The mean for left rotation for Group A is 61.97 with standard deviation of 8.92 whereas for Group B it is 61.24 with standard deviation of 8.90. The t-score came out to be 0.40 showing non-significance statistically with a p-value of 0.68.

The mean for right lateral flexion for Group A is 36.46 with standard deviation of 5.56 whereas for Group B it is 36.96 with standard deviation of 5.72. The t-score came out to be 0.408 showing non-significance statistically with a p-value of 0.77

The mean for left lateral flexion for Group A is 34.73 with standard deviation of 5.90 whereas for Group B it is 36.84 with standard deviation of 9.39. The t-score came out to be 0.185 showing non-significance statistically with a p-value of 1.33.

The mean for right side composite score for Group A is 82.87 with standard deviation of 14.29 whereas for Group B it is 90.72 with standard deviation of 12.25. The t-score came out to be - 2.917 showing significance statistically with a p-value of 0.04

The mean for right anterior for Group A is 79.39 with standard deviation of 12.42 whereas for Group B it is 80.19 with standard deviation of 11.83. The t-score came out to be -0.328 showing non-significance statistically with a p-value of 0.74.

The mean for right posterolateral for Group A is 66.5 with standard deviation of 11.78 whereas for Group B it is 79.75 with standard deviation of 14.65. The t-score came out to be -4.93 showing significance statistically with p-value of 0.00.

The mean for right posteromedial for Group A is 71.36 with standard deviation of 13.55 whereas for Group B it is 79.75 with standard deviation of 14.65. The t-score came out to be -3.149 showing significance statistically with p-value of 0.02.

The mean for left side composite score for Group A is 84.73 with standard deviation of 12.84 whereas for Group B it is 90.89 with standard deviation of 14.07. The t-score came out to be -2.26 showing significance statistically with a p-value of 0.026.

The mean for left anterior for Group A is 77.92 with standard deviation of 13.96 whereas for Group B it is 76.47 with standard deviation of 16.27. The t-score came out to be 0.47 showing non-significance statistically with a p-value of 0.63.

The mean for left posteromedial for Group A is 69.04 with standard deviation of 14.39 whereas for Group B it is 72.11 with standard deviation of 13.46. The t-score came out to be -1.09 showing non-significance statistically with a p-value of 0.27.

The mean for left posterolateral for Group A is 65.56 with standard deviation of 12.05 whereas for Group B it is 75.95 with standard deviation of 15.40. The t-score came out to be -3.71

showing significance statistically with p-value of 0.00.

## DISCUSSION

In the present study the balance of young females donning headscarf was affected in comparison to the controls and as with increasing age, neck proprioception declines eventually affecting the balance, preventive strategies should be developed and the women who regularly wear headscarf should be educated about the same so as to increase their functional efficiency and decrease the risk of falls. A study done by Laxman and teal suggests that cervical collars have no detrimental effect on standing balance as assessed by sway reactions on the Kistler force platform.<sup>[4]</sup>

A study done by Chi-Hsien Chi and teal suggests that long hair and clothing, which cover the neck, do not alter the effectiveness of cervical collar immobilization as measured by the cervical ROM device. According to their findings, a cervical collar does not significantly disturb standing balance in able-bodied women in the two age groups tested.<sup>5</sup> The results of this study indicate that soft cervical collars are capable of physically limiting motion in all directions when worn either way, but only up to 11 degrees. Motions in the sagittal plane are controlled to a greater degree, depending on collar positioning and long hair and high-necked clothing do not alter the effectiveness of cervical collar immobilization as measured by CROM.<sup>[5]</sup>

The aim of the study done by Rahm Atalla was to find in this work is to understand the mechanism of restrictive clothing on the performance of normal people and seek key

parameters pertinent to the effect of such clothing on posture, motion planning, and stability analysis. They tried to capture moment on the idea behind using motion capture systems is now well established and is being used in many applications. The motion studies showed that restrictive clothing leads to decrease in stride length leading to decreased short steps causing difficulty in maintain balance as gait is also affecting leading to an increased chance of falls.<sup>[6]</sup> Effect of clothing on human posture and balance is important and has been studied in various populations as the protective suits hinder body's movements. A study done by Unadilla at al concluded that fire workers protective suits significantly affected their posture and functional balance.<sup>[7]</sup> In a study done by Egan et al, effect of wearing chemical protective clothing was assessed.

It could be said that restrictive clothing may impose constraints on relative joint angle limits and hence obstruct movement. As restrictive clothing restrains a person from completing the ROM, it may result in compensatory or other feasible motions which would be inefficient and may probably unsafe. It has also been observed that headache significantly affects Cervical ROM also the endurance of anterior cervical musculature was found to be decreased in the females suffering from headache.<sup>[8]</sup>

In a study done by Joon-He Lee, it was found that forward head posture affects both static and dynamic balance.<sup>[9]</sup>

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As neck proprioception plays an important role in maintaining balance, it was observed in a study that joint position error was higher in women who wore headscarf regularly in comparison to women who never wore a headscarf indicating better proprioception in the control group.<sup>[10]</sup>

The results are consistent with the findings of the present study as the balance was found to be affected in the experimental group. Joint position error has also been known to be one of the predisposing factors towards the development of cervical pain and dysfunction.<sup>[11]</sup> Wearing of headscarf has been to hinder the cervical ROM but in the present study there was no significant difference between the control and experimental group for cervical ROM.

## CONCLUSIONS

The present study was conducted to see the effect of donning a headscarf on balance in young females. A total of 98 subjects were included in the present study and divided into the control and experimental group. The results of the study indicated that the control group had better balance as compared to the experimental group by Y balance test indicating that donning of headscarf affects balance in young females. Hence null hypothesis is rejected and experimental hypothesis is accepted.

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Source of Support: Nil, Conflict of Interest: None declared