

Association of Upper Crossed Syndrome with Neck Pain in Lactating Women

SHUMAYAM SHAFEEQ¹, ASMA NOREEN², ZAINAB NASRULLAH³, ALEENA MASOOD⁴, WAQAR UL HASSAN⁵, SHOAB AHMAD⁶, ADNAN HASHIM⁷

¹Former Student, University Institute of Physical Therapy, the University of Lahore

²Lecturer, TIMES Institute

^{3,4,5}Student, University Institute of Physical Therapy, the University of Lahore

⁶Former Student, University Institute of Physical Therapy, The University of Lahore

⁷Student, TIMES Institute

Corresponding author: Adnan Hashim, Email: adnanhashim199@gmail.com, Cell: 0300-4022024

ABSTRACT

Background and Introduction: Physiotherapy benefits women both in the antenatal and postnatal periods. Postnatal education is essential for guiding women about correct breastfeeding positioning. However, studies on the efficacy of this approach in developing countries like Pakistan are limited in the literature. This study is aimed to assess the association of upper crossed syndrome in lactating women.

Methods: Descriptive study design was used for this cross-sectional study in which the following inclusion criteria interviewed 141 lactating women of Age 15-47 years. All these women were inpatients in Gynecology Ward at District Head Quarters Hospital, Sheikhpura. The neck disability index, Reedco posture assessment, and Numeric pain rating scale were used for data collection. Data were analyzed using SPSS version 21. The Reedco scale assessed the posture alignment of the head, shoulders, and spine.

Results: 53% of the participants were from the 15-25 age group, and the rest were from different age groups ranging from 26-47 years. 79.4% had a cesarean section for the birth of their child. 80.9% had 1-3 children. 58.9% belong to the lower socioeconomic status. When the chi-square test was applied to check the association between all variables, it was evident that the patient's age is significantly associated with Reedco posture assessment and Neck disability index, Mode of delivery with Neck disability index. Still, there is no significant association between age and the Numeric pain rating scale, Birth history with the Numeric pain scale, and Reedco posture assessment. In the end, it was also revealed that Upper crossed syndrome and Neck pain had a statistically significant association of 0.033. (p -value < 0.05). This study has potential benefits for the community as it sheds light on an important issue that affects lactating women. By identifying a possible association between upper crossed syndrome and neck pain in lactating women, healthcare professionals can develop more effective treatment plans to alleviate the discomfort experienced by these women. This can lead to an improvement in their overall quality of life and mental health.

Conclusion: This study found an association between upper-crossed syndrome and neck pain. It was found that the lactating mothers with upper crossed syndrome were somehow related to bad Posture and suffered from musculoskeletal pain, especially neck pain. A lack of knowledge and awareness about correct positioning during breastfeeding is evidenced in this study. Women were unaware of the importance of physical therapy and the role of it during and after pregnancy.

Keywords: Lactation, Neck pain, Kyphosis, Lordosis, over inhibition, Antenatal, Postnatal, Winging of scapula, Posture

INTRODUCTION

The upper crossed syndrome can be explained as the tightness of major, minor, upper trapezius, sternocleidomastoid, sub occipitals, scalene, latissimus dorsi, upper limb flexors and pronators, masticators, and levator scapulae muscles. On the other hand, there is a weakness of the lower and middle trapezius, deep neck flexors mainly longus colli and capitis, scalene, upper limb extensors and supinator's, rhomboids, digastric and serratus anterior muscles.^{1,2} Czech Physician and Physiatrist Dr. Vlandimir Janda 1979 first described Upper Crossed Syndrome. It is also called Slouched Posture, Slumped Back, Rounded or Protracted Shoulders, Shoulder or Proximal Girdle Syndrome, Forward Head Posture, Cervical Crossed Syndrome, and Student Syndrome.³ This syndrome is better said to be a Forward Head or Turtle Head Posture or Poor Sitting Posture Syndrome.⁴ A forward head posture (FHP) or poor sitting posture increases thoracic kyphosis and more anteriorly shoulder position. This anteriorly positioned shoulder causes round shoulder syndrome. Such a posture is related to altered scapula kinematics, work, and muscular imbalance. These alterations cause musculoskeletal pain, especially in the upper body, neck, shoulders, upper thorax, and chest, and consequently increase muscular tension and stress resulting in various neuromuscular symptoms.⁵ Deep neck flexors is essential in supporting the lordosis of the cervical spine. It has been noticed that in neck pain, a few cervical spine muscles weaken; the most common of them are deep neck flexors. The syndrome is a transitional stage between the typical cervical vertebra and cervical spondylosis, so it may be one of the essential factors of cervical spondylosis, which may occur at an average age and happen more frequently.⁶ Furthermore, prolonged turtle head posture lessens the lordosis of the cervical spine of lower cervical

vertebrae. It increases kyphosis of upper thoracic vertebrae to keep balance, called Forward Head Posture (FHP). This Posture shortened the fiber of muscles around articulating points of atlantooccipital and exaggerated the powers around joints, producing chronic neck pain.^{7,8} When the head does not align with the body, it causes further impairments like Rounded Shoulders and an exaggerated thoracic curve. This increased kyphotic curve of the thoracic spine is for restitution of the line of gravity. These all impairments or malalignments form a slumped or slouched Posture. Usually, between the shoulder and mastoid process perpendicular to horizontal, that is, vertical adjustment is required. Hence, if the scapula's acromion process is more forward compared with the temporal bone's mastoid process, it will lead to Rounded Shoulders or Protracted Shoulders or Forward Shoulders Posture.⁹ This increase in both curves of the cervical lordosis and thoracic kyphosis puts stress on neck or cervical muscles, producing various pathological signs and symptoms later on.¹⁰ A correct or well-aligned Posture is one of the essential pointers to well-being. A lousy posture shows a poor correlation among body parts. These flaws produce muscle inhibition and tension; hence, inappropriate joint motion may cause musculoskeletal pains.¹¹ The neck is the most moveable portion of the whole spine. It carries the weight of our skull. Regular neck movements are necessary for most of the upper body's work. Something that is considered irritating, inconvenient, annoying is pain. So an unpleasant sensation from derangement of functions of neck is known as "Neck Pain."¹² It is also said that Neck pain is a disagreeable physical feeling due to disturbance of functions, ailment, or damage by any suffering.¹³ Neck pain is among the common findings in "bad posture syndrome." It affects the individual's life by putting stress on emotional, physical, mental, psychological and

social wellbeing. It affects the country's economy as well because the working hours decrease by less labor. Neck pain sufferer is not able to do daily activities efficiently and when it becomes chronic there would be a remarkable loss of activities and discomfort in the individual's life.¹⁴

The importance of my study is to check the relationship between Neck Pain and Upper Crossed Syndrome. As aforementioned earlier, there is a strong association in between both, usually bad Posture leads to neck pain. This study has to assess if increase curvature of both regions cervical lordosis and thoracic kyphosis put an abnormal force on joint, and put an abnormal stress on neck region hence inducing pain.

Objective: To assess the Association of Upper Crossed Syndrome with Neck Pain in Lactating Women.

METHODOLOGY

Study Design: A descriptive survey research design was used for this cross-sectional observational study.

Setting: Data was collected from DHQ Hospital, Sheikhpura.

Duration: Study was completed within 6 months after the approval of synopsis.

Sample Size: The sample size of 141 lactating women were calculated with 95% confidence interval

Confidence interval $1-\alpha=95$

Anticipated population proportion $P=0.373$

Absolute precision required $d=0.08$

Sample size $n=141$

$n = z^2 \frac{1-\alpha}{4} P(1-P)/d^2$

Sample Technique: Non-probability Convenient Sampling Technique

Sample Selection Criteria:

Inclusion Criteria:

- Sound physical and mental health
- Lactating women with neck pain history
- Postural deformity that is increased kyphosis of thoracic spine and increased lordosis of cervical spine

Exclusion Criteria:

- Stroke
- Traumatic injury
- Recent injury
- Any kind of injury
- Spondylolisthesis
- Any serious underlying pathology
- Cervical radiculopathy

Data Analysis: After taking informed written consent, data was collected through Numeric pain rating scale, Neck disability index and Reedco posture score. Data was analyzed using SPSS version 21 statistical package. All the data was categorical and was presented in the form of frequency and percentage. The comparison between age, socioeconomic status, birth history and other factors was analyzed by descriptive statistics. The association between neck pain and upper crossed syndrome in patients was determined via Chi square. The significance was determined by p-value (<0.05).

RESULTS

Table 1: Descriptive statistics of age and Birth History

		Frequency	%
Age	15-25 years	75	53.2
	26-36 years	63	44.7
	37-47 years	3	2.1
Birth History	1-3 children	114	80.9
	4-6 children	26	18.4
	7-9 children	1	0.7

Description: Table shows that 53% females are of 15-25 age groups, while 44.7% females are of 26-36 age group and 2.1% females are of 37-47 age group. Table shows that 80.9% females has 1-3 children, 18.4% has 4-6 children and 0.7% has 7-9 children.

Table 2: Descriptive statistics of Mode of Delivery and socio-demographics

		Frequency	%
Mode of Delivery	Normal	25	17.7
	Episiotomy	4	2.8
	Cesarean	112	79.4
Socio-demographics	Lower class	83	58.9
	Middle class	52	36.9
	Upper middle class	6	4.3

Description: Table shows that 79.4% females undergo cesarean section, 17.7% undergo episiotomy and 2.8% undergo normal delivery for birth of their child. Table shows that 58.9% females belong to lower class, 36.9% belong to middle class and 4.3% belong to upper middle class.

Table 3: Descriptive statistics of Numeric pain rating scale and REEDCO posture sheet statistics of women.

		Frequency	%
Pain (NPRS)	0-2 mild pain	7	5.0%
	3-6 moderate pain	59	41.8%
	7-10 severe pain	75	53.2%
Posture Score Sheet Head	Poor	5	3.5%
	Fair	72	51.1%
	Good	64	45.4%
Position	Left	33	23.4%
	Right	44	31.2%
	Equal	64	45.4%
Shoulder	Poor	5	3.5%
	Fair	72	51.1
	Good	64	45.4

Description: shows that 53.2% females have worst pain, 41.8% females have moderate pain and 5.0% females have mild pain in their neck. Shows that 51.1% females have twisted head to one side slightly, 45.4% females have erect head that gravity line passes through it and 3.5% females have head twisted to one side markedly. Shows that 45.4% females head have equal position, 31.2% females have head twisted to right side while 23.4% females head are twisted to left side. Shows that 51.1% female's one shoulder is slightly higher than other, 45.4% female's shoulders are level horizontally and 3.5% female's one shoulder is marked higher than other.

Table 4: Descriptive statistics of REEDCO posture sheet statistics of women.

		Frequency	%
Position	Left	44	31.2
	Right	33	23.4
	Equal	64	45.4
Spine	Poor	5	3.5
	Fair	72	51.1
	Good	64	45.5
Position	Left	43	30.5
	Right	34	24.1
	Equal	64	45.4
RPA Total Score	Poor	4	2.8
	Fair	73	51.8
	Good	64	45.4
NDI Total Score categorical	0-4 no disability	1	0.7
	5-14 mild disability	15	10.6
	15-24 moderate disability	47	33.3
	25-34 severe disability	50	35.5
	35-50 complete disability	28	19.9

Description: Shows that 45.4% females have equal shoulder, 31.2% females have left shoulder higher than other and 23.4% females have right shoulder higher than other. Shows that 51.1% females have laterally curved spine, 45.4% females have straight spine and 3.5% have marked laterally curved spine. Shows that 45.4% females have equal spine, 30.5% have laterally curved spine towards left and 24.1% females have laterally curved spine towards right. Shows that 62.5% patients of age group 15-25years had good Posture according REEDCO posture assessment scale. In comparison with other age group of 26-36 years in which 75.0%

poor posture was observed. When chi square test was applied to check association in both variables, it was found that there is significant association between age of patient and REEDCO posture assessment scale which is 0.281.(p-value<0.05). Shows that 56.0% of age group 15-25 years had severe disability due to neck pain, 64.3% of age group 26-36 years had complete disability due to neck pain, while 37-47 years age group had no disability at all. After applying chi square test to check association in both variables it was found that there is significant association between age of patient and neck disability index that is 0.000.(p-value 0.005).

DISCUSSION

Younger individuals (15-25 years) appear to have better posture overall, with 62.5% demonstrating good posture according to the REEDCO scale. However, this group also shows a high level of severe disability due to neck pain (56.0%). This might be surprising, as one might typically expect younger individuals to have fewer physical ailments. It could be due to factors such as increased screen time, poor ergonomics during work or study, or lack of physical activity. For the 26-36 years age group, poor posture is significantly more prevalent (75.0%), and a substantial percentage of this group (64.3%) also reports complete disability due to neck pain. This increase in both poor posture and neck pain disability might be due to prolonged periods of poor posture, lifestyle factors, occupational hazards, or the natural aging process.

Interestingly, the 37-47 years age group doesn't report any disability due to neck pain. The reasons for this could be diverse, ranging from lifestyle changes, better ergonomics, increased physical activity, or potentially effective treatment strategies for the ailments observed in the previous age groups. Statistically, the Chi-square tests revealed significant associations between both variables (posture and neck disability) with age. The p-value (<0.05 for the posture test and 0.005 for the neck disability test) indicates that these findings are likely not due to random chance.¹⁵

Regarding pain, the youngest age group (15-25 years) primarily experienced mild pain (85.7%), whereas the middle age group (26-36 years) mostly experienced moderate pain (47.5%). Interestingly, the oldest age group (37-47 years) had a small percentage of individuals experiencing the worst pain (2.7%). However, this doesn't align with typical expectations, as we might assume pain to increase with age due to factors like degenerative conditions.

On the posture aspect, birth history seems to have an effect on posture, with those having a birth history of 1-3 showing mostly good posture (87.5%). However, individuals with a birth history of 4-6 mostly had poor posture (25.0%), while those with a birth history of 7-9 had a small percentage with fair posture (1.4%). This could imply that an increased number of births may negatively affect posture, perhaps due to physical changes or stresses related to pregnancy and childbirth.

But in both cases, the statistical analysis found no significant association, meaning that the observed differences could be due to random variation rather than a meaningful relationship.

Without prior studies or data for direct comparison, it's challenging to provide an accurate comparison. However, we can discuss it in general terms:

In the context of previous literature, you might expect an increase in pain with increasing age due to the progression of degenerative changes or chronic conditions. If previous studies showed a significant association between age and pain, then the current study's findings would suggest a shift in this pattern, which could be due to a variety of factors, such as changes in lifestyle, healthcare practices, or the specific demographics of your sample.

Similarly, if previous studies have found an association between birth history and posture, the current study's results challenge that finding. It might suggest changes in post-pregnancy healthcare, exercise, or other factors impacting posture.¹⁶

If previous studies showed different results, the increased association could be due to lifestyle changes, such as increased sedentary behavior and screen time, leading to posture issues in younger age groups. It could also be due to improved understanding and prevention strategies for postural problems in older age groups. The relationship between age and neck disability could be influenced by a range of factors, including occupational habits, physical activity levels, and prevalence of conditions such as arthritis. If previous studies showed less association, it might reflect changes in these factors over time.

The association between cesarean section and neck disability is quite intriguing, as these factors are not typically directly related. This could reflect indirect effects, such as changes in physical activity and stress levels after different types of childbirth. If previous studies did not show this association, it might suggest a shift in these indirect effects.

This is a commonly recognized association, as upper crossed syndrome, characterized by muscular imbalances in the upper body, often leads to neck pain. If this finding is consistent with previous research, it underscores the importance of addressing muscular imbalances to prevent and manage neck pain.¹⁷

CONCLUSION

The role of physiotherapy was not fully understood in the context of pregnancy and postpartum period. Most of the patients were not aware about the correct positioning for breastfeed. Due to abnormal posture women who breastfeed their baby suffer from various musculoskeletal problems mainly neck pain. In this study, it is found that there is an association between neck pain and upper crossed syndrome.

REFERENCES

- Mujawar JC, Sagar JH. Prevalence of upper cross syndrome in laundry workers. *Indian Journal of Occupational and Environmental Medicine*. 2019;23(1):54.
- Doms Jk. Upper and lower crossed syndrome: fixing the slouch for better health. 2017.
- Kirthika SV, Sudhakar S, Padmanabhan K, Ramanathan K. Impact of upper crossed syndrome on pulmonary function among the recreational male players: A preliminary report. *Saudi Journal of Sports Medicine*. 2018;18(2):71.
- Muscolino J. Upper crossed syndrome. *Journal of the Australian Traditional-Medicine Society*. 2015;21(2):80.
- Kang J-H, Park R-Y, Lee S-J, Kim J-Y, Yoon S-R, Jung K-I. The effect of the forward head posture on postural balance in long time computer based worker. *Annals of rehabilitation medicine*. 2012;36(1):98.
- Kwon JW, Son SM, Lee NK. Changes in upper-extremity muscle activities due to head position in subjects with a forward head posture and rounded shoulders. *Journal of physical therapy science*. 2015;27(6):1739-42.
- Gupta BD, Aggarwal S, Gupta B, Gupta M, Gupta N. Effect of deep cervical flexor training vs. conventional isometric training on forward head posture, pain, neck disability index in dentists suffering from chronic neck pain. *Journal of clinical and diagnostic research: JCDR*. 2013;7(10):2261.
- Park J, Kim J, Kim J, Kim K, Kim N, Choi I, et al. The effects of heavy smartphone use on the cervical angle, pain threshold of neck muscles and depression. *Advanced Science and Technology Letters*. 2015;91(3):12-7.
- Singla D, Veqar Z. Association between forward head, rounded shoulders, and increased thoracic kyphosis: a review of the literature. *Journal of chiropractic medicine*. 2017;16(3):220-9.
- AlAbdulwahab SS, Kachanathu SJ, AlMotairei MS. Smartphone use addiction can cause neck disability. *Musculoskeletal care*. 2017;15(1):10-2.
- Ruivo RM, Pezarat-Correia P, Carita AI. Cervical and shoulder postural assessment of adolescents between 15 and 17 years old and association with upper quadrant pain. *Brazilian journal of physical therapy*. 2014;18(4):364-71.
- Tanveer F, Shahid S. Prevalence of neck pain among Doctors of Physical Therapy students of University of Lahore due to bad posture. *Rawal Medical Journal*. 2017;42(2):172-5.
- Lampf C, Rudolph M, Deligianni CI, Mitsikostas DD. Neck pain in episodic migraine: premonitory symptom or part of the attack? *The journal of headache and pain*. 2015;16(1):80.
- Genebra CVDS, Maciel NM, Bento TPF, Simeão SFAP, De Vitta A. Prevalence and factors associated with neck pain: a population-based study. *Brazilian journal of physical therapy*. 2017;21(4):274-80.
- Page P. Current concepts in muscle stretching for exercise and rehabilitation. *Int J Sports Phys Ther*. 2012;7(1):109-119.
- Sahrmann S. *Diagnosis and treatment of movement impairment syndromes*. St Louis, MO: Mosby; 2002.
- Shariat A, Cleland JA, Danaee M, Kargarfard M, Sangelaji B. Effects of stretching exercise training and ergonomic modifications on musculoskeletal discomforts of office workers: a randomized controlled trial. *Braz J Phys Ther*. 2018;22(2):144-153. doi:10.1016/j.bjpt.2017.08.003