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Prevalence of thoracic outlet syndrome among patients visiting physical therapy outpatient department of public sector Tertiary Care Hospitals, Peshawar

Khawla
Clinical Physical Therapist, Member of Milestone Child Development Peshawar
Corresponding author email:Kmu.baloch@gmail.com

Hazrat Ali
MS spt Riphah International University Gulberg Green Islamabad Pakistan
Email: hazratali9628312@gmail.com

Gul Bushra
MS spt
Email: gulbushratareen@gmail.com

Hafiz Yaseen Khan
Senior Lecturer/Coordinator DPT Mahboob Medical Institute
Email: yasenkhan46@gmail.com

Said Khaliq
MSPT
Email: saidkhan8007@gmail.com

Rab Nawaz
Senior Lecturer at Sarhad University Peshawar
Email: Nawaz.siahs@suit.edu.pk

***Abstract*---**The indications and symptoms in the upperextremity brought on by compression of the brachial plexus, subclavian vein, and/or subclavian artery at the thoracic outlet were originally referred to as thoracic outlet syndrome (TOS). The symptoms of neurogenic thoracic outlet syndrome (NTOS) are caused by compression of the brachial plexus roots as they travel through the thoracic outlet. The most typical symptom of thoracic outlet syndrome is neurogenic thoracic outlet syndrome (NTOS). The brachial plexus is compressed and irritated, which causes its symptoms.A cross-sectional study was conducted from March 2023 to June 2023 among patients visiting

Physical therapy outpatient department of public sector tertiary care hospitals Peshawar. The DASH questionnaire was distributed to all patients according to inclusion criteria from different hospitals to collect data on the prevalence of thoracic outlet syndrome.The study found that the prevalence of thoracic outlet syndrome was higher in female. The prevalence was higher among female housewives (77.77%) compared to male (63%). Risk factors associated with this pain included improper posture in same position while working, long work durations, repetitive tasks, and restricted neck movements.This study concluded that out of total participants 2 females and 3 males from HMC, 3 females and 6 males from LRH, and 20 females and 10 males from KTH. Notably, the number of females affected by TOS in our study exceeded that of males. One potential explanation for this gender difference in TOS prevalence could be the prolonged periods of sitting or standing in the same position commonly experienced by females.

***Keywords*---**thoracic outlet syndrome, brachial plexus, subclavian artery, subclavian vein.

1 Introduction

The indications and symptoms in the upper extremity brought on by compression of the brachial plexus, subclavian vein, and/or subclavian artery at the thoracic outlet were originally referred to as thoracic outlet syndrome (TOS) in 1956 (Masocatto, et al. 2019).Despite the low reported prevalence of 3 to 80 per 1,000, TOS can be very crippling when it does. Even though it's uncommon, this condition is increasingly being recognized in people who engage in repetitive activities, such as those who play overhead sports like baseball, softball, volleyball, and swimming. The symptoms of the thoracic outlet can include pain, arm heaviness, weakness, numbness, and tingling. The lateral neck musculature, which includes the middle and anterior scalene, and the tissues between the clavicle superiorly and the first rib inferiorly make up the thoracic outlet (Arellano et al. 2021), (Nuutinen et al. 2022).

A common musculoskeletal ailment, shoulder pain affects up to 67% of people over their lifetime in developed countries (Kc. Sharma et al. 2019). 90–95% of instances involve NTOS, 3% involve VTOS, and 1% involves ATOS. Between the ages of 20 and 50, signs and symptoms are typically unilateral, primarily affecting the dominant arm. While ATOS affects both sexes equally, VTOS is more common in men, NTOS is more common in women. Athletes (in sports like volleyball, baseball, swimming, bodybuilding, etc.), manual workers, or people engaging in strenuous activity are more likely to develop VTOS(Camporese et al. 2022).

The scalene or pectoralis minor muscles fibrosis and hypertrophy, as well as scar tissue deposition on the brachial plexus nerves, are the result of a continuous process of repetitive injury. Predisposing anatomical features like musculotendinous deformities or cervical ribs may make this worse (Ohman et al. 2020). Dynamic positional compression is a hallmark of the very uncommon,

challenging, and occasionally contentious illness known as Neurogenic Thoracic Outlet Syndrome (NTOS) (Balderman et al. 2019).

Patients are prone to developing thoracic outlet syndrome due to their repetitive and prolonged work, poor posture and high stress level. This study aimed to find out prevalence of thoracic outlet syndrome among public sector tertiary care hospitals Peshawar.

2 Material & Methods

The purpose of this three-month cross-sectional study was to ascertain the prevalence of thoracic outlet syndrome in Peshawar's public tertiary care hospitals. The study took place from March 2023 to June 2023. A basic random sampling method was used to gather information from 44 patients who were attending various Peshawar hospitals. A DASH questionnaire, a common questionnaire, was used for data collection. Participants in the study ranged in age from 18 to 68 years, with the exclusion of those with adhesive capsulitis, deep vein thrombosis, and cervical radiculopathy. The census sample size was chosen because of the infinite population. Permission was obtained from the respective departments to collect data from male and female patients, and informed consent was obtained from each participant. Descriptive statistical analysis was conducted using SPSS v20.0, and the data was presented in tables and graphs for clarity and ease of interpretation.

Test Performed: Adson's Test

The client is asked to rotate the neck ipsilaterally, flex it laterally to the opposite side, while the therapist palpates the strength of the radial pulse by passively extend or externally rotate patient's arm.

3 Results and Discussion

The prevalence was higher among female housewives (77.77%) compared to male (63%). The age of majority participants 15 (34.1%) age were 18_28 while less were 13 (29.5%) were 29_38, less than this 11(25%) participants were 39_48, other than these 4 (9.1%) participants were 49_58 and lowest was 1 (2.3%) age 59_68.Risk factors associated with this pain included improper posture in same position while working, long work durations, repetitive tasks, and restricted neck movements.

Studies conducted among patients in various countries have consistently shown a high prevalence of thoracic outlet syndrome (TOS) in female.The study conducted by (Iftikhar et al., in 2020), correlate our study which found the notion that woman with thoracic outlet syndrome exhibit greater strength compared to men. However, there are some differences between the two studies. While this study focused on an age-based distribution of 18-60 years, that study encompassed a broader age range of 15-75 years. Nonetheless, both studies indicated a higher prevalence of the disease among married women, who were predominantly housewives.

A similar study conducted by (Daley et al., in 2022) further supports this finding, indicating a higher proportion of females than males in this particular condition. That study included 27% men and 73% women. Similarly, in this study, it was observed that 40.9% were men and 59.1% were women affected by this condition.

Table1
Age of research participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 28	15	34.1	34.1	34.1
	29 to 38	13	29.5	29.5	63.6
	39 to 48	11	25.0	25.0	88.6
	49 to 58	4	9.1	9.1	97.7
	59 to 68	1	2.3	2.3	100.0
	Total	44	100.0	100.0	

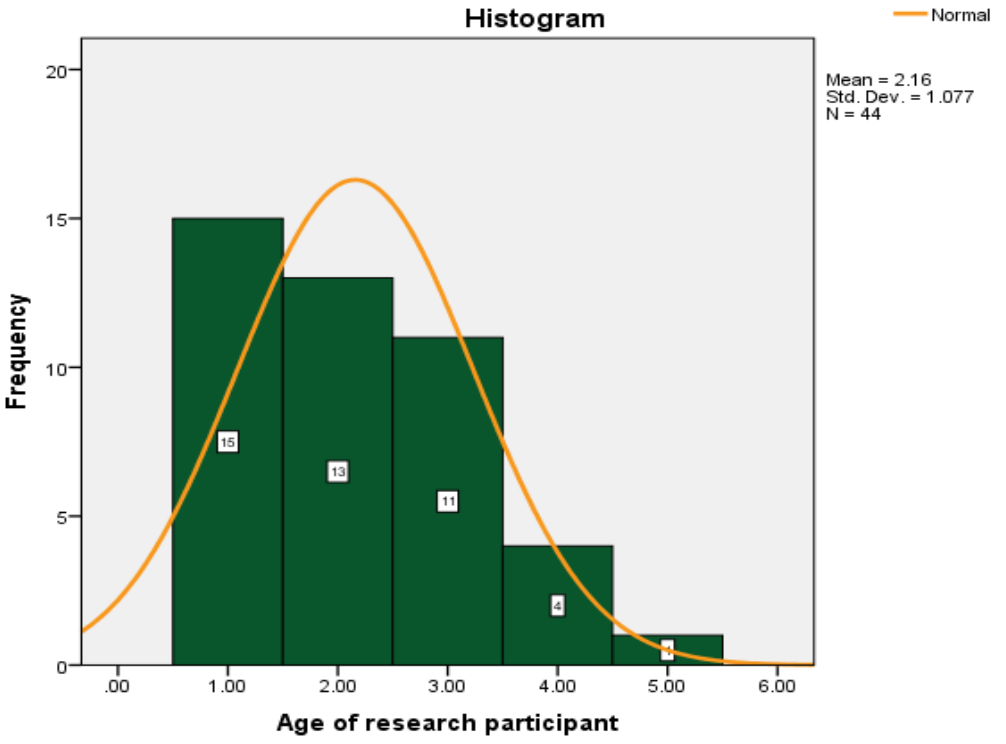

Figure 1: The below figure 1 and table 1 shows the frequency of age of our total participants. The majority participants 15 (34.1%) age were 18_28 while less were 13 (29.5%) were 29_38, less than this 11(25%) participants were 39_48, other than these 4 (9.1%) participants were 49_58 and lowest was 1 (2.3%) age 59_68.

Table2
Marital status of research participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	31	70.5	70.5	70.5
	Unmarried	13	29.5	29.5	100.0
	Total	44	100.0	100.0	

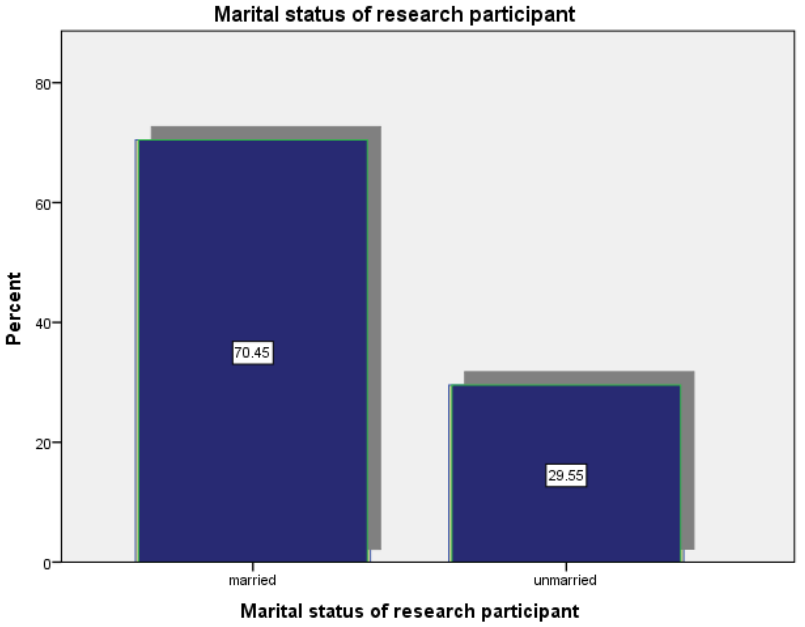

Figure 2: The above table 2 and figure 2 shows that married participants 31 (70.5%) were more affected by TOS as compared to unmarried 13 (29.5%) participants

Table 3
Occupation of research participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	10	22.7	22.7	22.7
	housewife	17	38.6	38.6	61.4
	Labor	4	9.1	9.1	70.5
	gardener	1	2.3	2.3	72.7
	shopkeeper	1	2.3	2.3	75.0
	electrician	2	4.5	4.5	79.5
	housemaid	2	4.5	4.5	84.1
	businessman	1	2.3	2.3	86.4
	Teacher	1	2.3	2.3	88.6
	engineer	1	2.3	2.3	90.9
	technician	1	2.3	2.3	93.2
	Other	3	6.8	6.8	100.0
	Total	44	100.0	100.0	

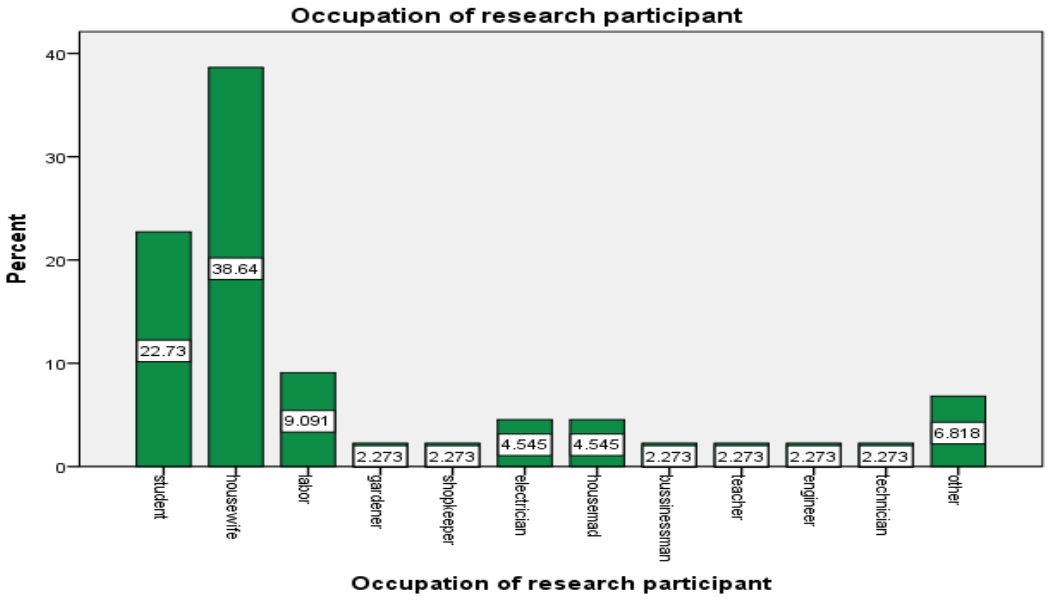

Figure 3: The above table 4 and figure 4 shows that housewives 17 (38.64%) were affected by TOS, while students 10 (22.73%), labor 4(9.1%), gardener, shopkeeper, businessman, teacher, engineer and technician 1(2.3%) were at risk, labor 4 (9.1%), other 3 (6.8%), and electrician and housemaid 2 (4.5%) were affected.

Table 4
Hospital of research participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	KTH	31	70.5	70.5	70.5
	LRH	8	18.2	18.2	88.6
	HMC	5	11.4	11.4	100.0
	Total	44	100.0	100.0	

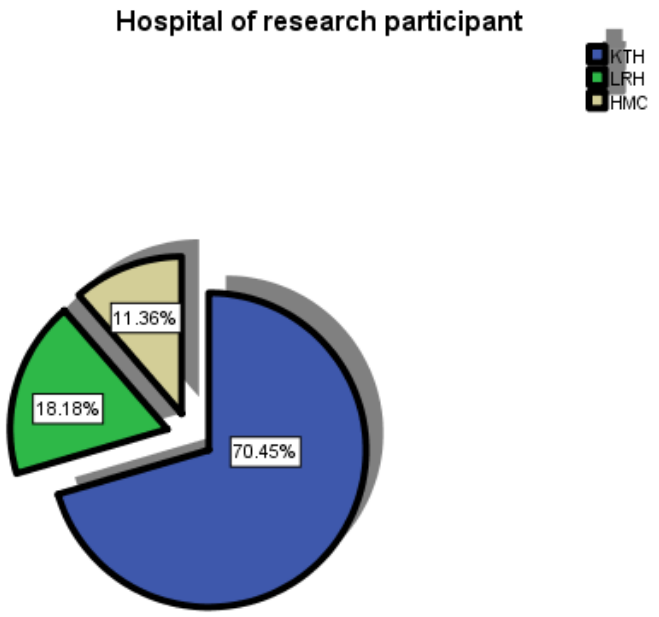

Figure 4: The above table 5 and figure 5 shows that participants 31 (70.5%) participants visited KTH, while 8 (18.2%) visited LRH, 5 (11.4%) participants visited HMC

Table 5
Test performed at research participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive	41	93.2	93.2	93.2
	Negative	3	6.8	6.8	100.0
	Total	44	100.0	100.0	

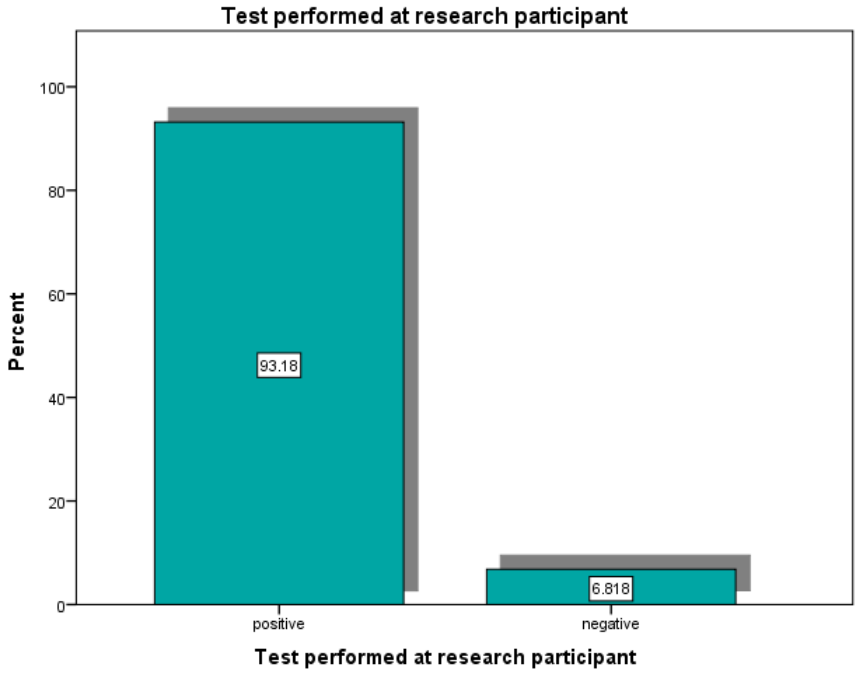

Figure 5: The above table 6 and figure 6 shows that the test performed was positive for participants 41 (93.2%) while test was negative for participants 3 (6.8%)

This study conducted by (Masocatto et al., in 2019), aimed to investigate the frequency of thoracic outlet syndrome in tertiary care hospitals in Peshawar, focusing on the upper extremity symptoms resulting from the compression of the brachial plexus, subclavian vein, and/or subclavian artery at the thoracic outlet. This study differs from the current study due to findings, which suggested that thoracic outlet syndrome is more prevalent among individuals with a history of previous surgeries. However, our study observed thoracic outlet syndrome cases among individuals seeking treatment at public sector physical therapy outpatient departments.

In contrast to this study, a separate study conducted by (Kaczmarek et al., in 2022) presents differing findings regarding the strength of individuals with thoracic outlet syndrome. That study suggested that men exhibit higher strength compared to women. Specifically, they observed six women and seventeen men experiencing this condition. In contrast, this study indicated eighteen males and twenty-six females diagnosed with thoracic outlet syndrome.

4 Conclusion

The findings of the current study indicate a higher susceptibility to thoracic outlet syndrome (TOS) among married women who are housewives and fall within the age range of 18 to 60, when compared to other females and males. One potential explanation for this gender difference in TOS prevalence could be the prolonged

periods of sitting or standing in the same position commonly experienced by females.

Limitation

This study had several limitations, including a limited sample size. Restricted number of hospitals, which were chosen based on feasibility. Additionally, we faced constraints in terms of time available for conducting the study. These limitations should be taken into account when interpreting the results and generalizing them to a broader population.

Recommendation

Indeed, further studies are needed to determine the prevalence of thoracic outlet syndrome (TOS) more accurately. It would be valuable to expand the investigation to include additional hospitals, institutes, and private clinics to ensure a representative sample. Moreover, conducting a randomized controlled trial (RCT) would provide a more rigorous experimental design compared to the analytic cross-sectional approach utilized in this study. Further research with larger sample sizes and a more diverse range of healthcare settings would be beneficial to obtain a comprehensive understanding of thoracic outlet syndrome.

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