Prevalence of Hamstring Tightness in Western Toilet Users in Urban Areas

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Abstract- Background - Flexibility –the ability to rotate a single joint or series of joints smoothly and easily through an unrestricted, pain-free ROM. The flexibility dysfunction is a widespread problem which is faced by the common people. The musculoskeletal disorders are the group of disorders that influence on the musculoskeletal system involving nerves, tendons, and the muscles & supporting structures. The muscle tightness leads to an imbalance when acting on the joint and in the long term it can lead to pain and weakness Also it can result in a number of issues which can lead to some difficulties while walking and doing other activities. Physical activity leads to the working of the circulatory system to provide oxygen-rich blood throughout the whole body to the muscles. When sedentary the muscles can go into tightness due to lack of oxygen. When sitting for long periods, a person may round the shoulder involuntary. This position can cause shallow breathing which will cause a reduction in the oxygen flow to the muscle tissues. Inability to extend the knee over 160 degrees with the hip at 90 degrees is an indicator of hamstring tightness. The flexibility in modern people is usually reduced. The habit of toileting can affect the flexibility of most of the population.

Methodology- The study group consisted of 92 people including both the male and female, of age group 40 – 60 years who use western toilet. Straight leg raise test & Active knee extension test was used as outcome tool to measure the hamstring tightness.

Results- In this study, after the data analysis, it was found that there is a significant prevalence of hamstring tightness in western toilet users.

Conclusion- In the final analysis, it is concluded that, western toilet users had a considerable prevalence of hamstring tightness in western toilet users in urban areas, it is also concluded that hamstring tightness is more likely to develop bilaterally in people who use western toilets than unilaterally.

Keywords- Hamstring muscle, Tightness, Western toilet users.

I. INTRODUCTION

Flexibility –the ability to rotate a single joint or series of joints smoothly and easily through an unrestricted, pain-free ROM.[1]

The maximum physical activity performance and musculoskeletal functions achieved by the vital component, flexibility.[2]

The ability of an individual to move smoothly depends on his flexibility, an attribute that enhances both the safety and optimal physical activity.

The hamstring is an example of a muscle group that tends to get shortened.[3]

Anatomy:-The muscles of the back of the thigh are called the hamstring muscles.

They are the:-

Semitendinosus:- It has a long tendon insertion,

Semimembranosus :- Its deep to the semitendinosus,

Biceps Femoris:- It has two heads of origin – long & short.

And the *Adductor magnus*:- This is the largest muscle of this compartment.

The hamstring muscles act as flexors of the knee and extensors of the hip. [4]

The flexibility dysfunction is a widespread problem which is faced by the common people.

The musculoskeletal disorders are the group of disorders that impact on the musculoskeletal system involving nerves, tendons, and the muscles & supporting structures.

The muscle tightness leads to an imbalance when acting on the joint and in the long term it can lead to pain and weakness Also it can lead to a number of

issues that can lead to some difficulties while walking and doing other activities.

Flexibility is a vital component of fitness for musculoskeletal functioning and maximizing the performance of physical activities and a sedentary lifestyle can hamper the flexibility of the muscles, also it can reduce the range of motion.

MECHANISM:- Physical activity leads to the working of the circulatory system to provide oxygen-rich blood throughout the whole body to the muscles. When sedentary the muscles can go into tightness due to lack of oxygen. When sitting for long periods, a person may round the shoulder involuntary. This position can cause shallow breathing which will lead to a shortage of oxygen being supplied to the muscle tissues.[5]

Science has made recent discoveries that show muscle stiffness is an unseen illness that can restrict daily tasks.[6]

Older persons who have tight hamstrings may walk more slowly and with shorter strides, which might affect their dynamic balance.[7]

Inability to extend the knee over 160 degrees with the hip at 90 degrees is a sign of hamstring tightness.[8] The flexibility in modern people is usually reduced. The

Gender	Male	Female
	43	49

habit of toileting can affect the flexibility of most of the population.[2]

II. MATERIALS AND METHODOLOGY

This was a study to find out prevalence of hamstring tightness in western toilet users in urban areas.

The study was carried out in krishna College of Physiotherapy, Karad. An acceptance of the research was obtained from the protocol committee and ethical committee of Krishna Vishwa Vidyapeeth deemed to be university, karad.

An observational research project was carried out for duration of 1 year. Individuals were approached and individuals who met the requirements for inclusion were chosen. The purpose of was explained and the research was carried out by taking consent of each individual through a consent form. 92 individuals were selected.

The inclusion criteria were male and female who spend most of the time sitting on the chair / toilet seats and those who use only western toilets from the age group of 40-60 years.

The exclusion criteria were the Recent fracture of lower limb, Any pain due to pathology, decreased range of motion due to stiffness in knee and ankle, any soft tissue injury and pregnancy.

Primary outcome was straight leg raise test and active knee extension test.

The individuals were explained about the purpose of study. All the participants were educated and knew English.

Statistical analysis and interpretation was done for the each individual to find out the prevalence of hamstring tightness in western toilet users in urban areas.

III. STATISTICAL ANALYSIS

For sample size was calculated using the formula below.

$n= 4pq/l^2$

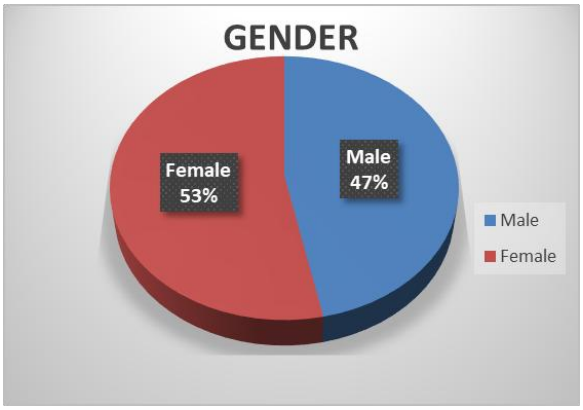
n=92

The straight leg raise test and active knee extension test was used. Statistical analysis of recorded data was done by using Excel.

RESULT-

Table No. 1

Gender -

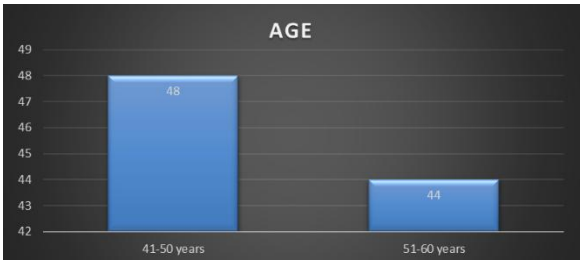


Interpretation - The above table revealed that there was 47% of males and 53% of females were taken.

Table No. 2

Age distribution –

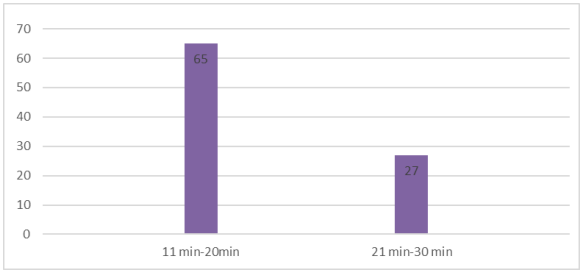
Age		
	41-50years	51-60years
	48	44



Interpretation - The above table shows that 48 people were in the age group of 41-50 years whereas in a group of 51-60, it was about 44 people were taken.
The Age mean = 50.39130.

Table No. 3
Average duration –

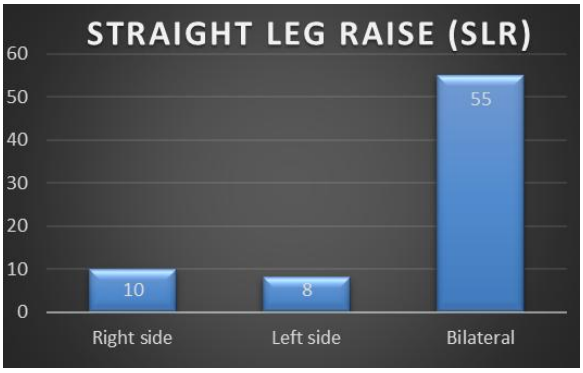
Average Duration	11min-20min	21min-30min
	65	27



The above table shows that 65 people spent 11 min to 20 min and 27 people were found they spend 21 min to 30 min in the western toilet.
The Duration mean = 18.05434.

Table No. 4
Straight leg raise -

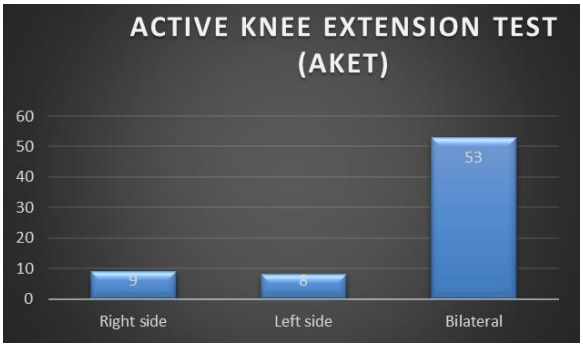
Straight leg raise (SLR)	Right side	Left side	Bilaterally
	10	8	55



Interpretation – The above shows that there were 10 people had the right side straight leg raise test positive, on the left side it is 8, and bilaterally, about 55 people had straight leg raise test positive. Total 73 people were found positive for straight leg raise test.

Table No. 5

Active knee extension test (AKET)	Right side	Left side	Bilaterally
	9	8	53



Interpretation – The above table shows that there were 9 people who had the right side active knee extension test positive, on the left side it is 8, and bilaterally about 53 people had active knee extension test positive.
Total 70 people were found positive for active knee extension test.

IV. RESULT

In this study, after the data analysis, It was discovered that there is a high incidence of hamstring tightness in western toilet users.
There were 92 participants included in this study.
In the straight leg raise test 73 individuals tested positive for this test, out of which 10 people was having right side positive, 8 people was having left side positive and 55 people had bilateral straight leg raise test (SLRT) positive.
In active knee extension test 70 individuals tested positive for this test, out of which 9 people was having right side positive, 8 people was having left side positive and bilaterally it was about 53 individuals tested positive for the active knee extension test (AKET).
The Age mean = 50.39130.
The Duration mean = 18.05434.

The prevalence of hamstring tightness in western toilet users was significantly observed.

V. DISCUSSION

The study's objective was to identify the prevalence of hamstring tightness in western toilet users in urban areas.

The objective was to evaluate the severity of hamstring tightness in western toilet users, As per the straight leg raise (SLRT) and active knee extension test (AKET).

A research by Rozina Bhimani et al. on the Prevalence and Characteristics of muscular Tightness in Young Adults came to the conclusion that the young participants in the study had a high frequency of muscular tension. Compared to men, women experienced constriction and pain more frequently.

Findings show that the majority of young individuals manage this sickness without consulting a doctor, which leads to the illness developing into a chronic condition.[6]

As per our study western toilet users had a strong prevalence of hamstring muscle tightness, it is also concluded that hamstring tightness is more probably develop bilaterally in people who use western toilets than unilaterally.

There were 92 participants included in our study.

In the straight leg raise test 73 Individuals tested positive for this test, out of which 10 people was having right side positive, 8 people was having left side positive and 55 people had bilateral straight leg raise test (SLRT) positive.

In active knee extension test 70 individuals tested positive for this test, out of which 9 people was having right side positive, 8 people was having left side positive and bilaterally it was about 53 individuals tested positive for the active knee extension test (AKET).

The age mean was 50.39130 and the duration mean was 18.05434.

The prevalence of hamstring tightness in western toilet users was significantly observed.

As stated by study Bhagyashree K. Koli 1 and Deepak B. Anap2, titled prevalence and severity of hamstring tightness among college student: a cross sectional study, hamstring tightness is very common among college-bound students in the 18–25 age group. To prevent lower quadrant musculoskeletal problems, it is crucial to understand the importance of hamstring stretching.[11]

The second most common condition is urinary tract infections (UTIs) in the human body, affecting millions of people annually, according to research by Subramani Parasuraman, Lim Ee Wen, and Aaseer Thamby Sam. The reasons behind the increased risk of urinary tract infections in women are poorly understood, and while UTIs are less common in men than in women, they are extremely serious when they do occur. Those who use public and Western/sitting toilets are most probably to get UTIs and fungal infections.

The public needs to be better informed about the proper physiological posture for defecation since it is a significant physiological event. Squatting is a recommended way of defecation since it avoids gastrointestinal diseases and strengthens the muscles in the lower limbs. The study also revealed the necessity of teaching the general public about personal cleanliness in relation to toilet use, proper defecation postures, and ways to lower the risk related to the urinary tract infections.[9]

Therefore, it is more favourable to use Indian toilet over western toilet.

According to a pilot study on pregnancy and labour outcomes in western-style sitting versus squat toilet users. Pooja Singh1, Sandhya Jain1*, and Shalini Rajaram1 have come to the conclusion that, Globalization has changed not just what we eat, drink, and discuss, but also address what kind of toilet seat individuals usually use. Squatting is considered the most appropriate position for micturition or bowel evacuation since it is in line with human anatomy and physiology, despite the reality that it may appear outdated and backward. Squatting is recommended as an important resistance exercise to strengthen the abdominal and pelvic floor muscles, which is believed to potentially prepare women for a more natural delivery. Intranatally, squatting position encourages rapid descent of baby by virtue of gravity and by increasing the diameter of the pelvis by as much as 20 to 30% and is connected to a lower risk of instrumentation, caesarean deliveries, and perineal tears. They discovered that squatting toilet users had positive results in various areas, like the percentage of vaginal deliveries that are normal, the length of the second stage of labour, the reduction of genitourinary infections, etc. Users of toilet seats that squatted had

various favourable obstetric outcomes, most notably a higher rate of vaginal deliveries that are normal. [10]
Indian toilets do not allow for direct body interaction with the seat. As a result, There's a lower chance of urinary tract infection (UTI). However, in Western toilets, the toilet seat frequently comes into contact with our skin.
Squatting facilitates the full removal of waste products from our body colons. Hence, Colon cancer and other illnesses can be avoided. This stops the likelihood of appendicitis, constipation, and other illnesses that may result in colon cancer.
Constipation is avoided by using Indian toilets due to the way our body is positioned while using Indian toilet, which aids in the full excretion of waste. It exerts a significant amount of pressure, making our body's colon clear. The doctors discovered a fascinating truth based on their studies and research. They discovered that compared to Indian toilets, the incidence of stomach-related illnesses is higher in western toilet.
Using Indian toilet is like exercising, we are essentially performing a kind of squat exercise. Sitting in this manner strengthens our legs and also puts them in motion.
Therefore, using Indian toilets is far more advantageous than utilizing Western toilets since there is a lower possibility of hamstring tightness, and a reduced risk of UTIs, and it strengthens the muscles in the abdomen and pelvic floor, which may help women for a more natural delivery.

VI. CONCLUSION

In the final analysis, it is concluded that, western toilet users had a considerable prevalence of hamstring tightness in western toilet users in urban areas , Additionally, it is concluded that hamstring tightness is more likely to develop bilaterally in people who use western toilets than unilaterally.

VII. RECOMMENDATIONS

1. Less sample size.
2. Further complication arising from hamstring tightness.
3. Treatment for hamstring tightness.

Conflict of Interests: In this study, there were no conflicts of interest.

Ethical Clearance: Ethical clearance was taken from institutional ethical committee of Krishna Vishwa Vidyapeeth, Deemed to be university, Karad.

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REFERENCES

[1] Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18.1
[2] Kaliyaperumal A, Dharani J, Neelamegam D. Comparison between indian and western toilet user on hamstring and ankle flexibility among housewives. International Journal of Physical Education Sports Management and Yogic Sciences. 2021;11(2):13-22.
[3] Weerasekara I, Kumari I, Weerarathna N, Withanage C, Wanniarachchi C. The prevalence of hamstring tightness among the male athletes of university of peradeniya in 2010. J Palliative Care Med. 2013;1(108):2.
[4] Chaurasia BD. Human anatomy. New Delhwwai, India: CBS Publisher; 2004.
[5] Mane A, Yadav T. Prevalence of Iliotibial Band Tightness in Prolonged Sitting Subjects. Indian Journal of Public Health Research & Development. 2020 May 18;11(5):44-8.
[6] Bhimani R, Hang JT. Prevalence and Characteristics of Muscle Tightness in Young Adults. Orthopaedic Nursing. 2022 May 1;41(3):221-6.
[7] Thakur D, Rose S. A study to find out the correlation between the right and left hamstring length in both genders to determine the prevalence of hamstring tightness among college students. Journal of Health and Allied Sciences NU. 2016 Dec;6(04):46-52.
[8] Naqvi R, Arshad N, Imran M, Aftab AA, Batool S. Prevalence of hamstring tightness among university students in Lahore, Pakistan. Rawal Medical Journal. 2019 Jan 12;44(4):853-.
[9] Parasuraman S, Wen LE, Sam AT, Christapher PV, Kumar KV. Analysis of correlation between defecation posture and risk of urinary tract

infections among adolescent populations. Environmental Disease. 2016 Apr 1;1(2):77-82.

[10] Singh P, Jain S, Rajaram S, Rathi V, Gupta B, Kalra K. Pregnancy and labor outcomes in squat versus western style sitting toilet users: a pilot study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 Nov 1;9(11):4602

[11] Koli BK, Anap DB. Prevalence and severity of hamstring tightness among college student: A cross sectional study. International Journal of Clinical and Biomedical Research. 2018 Apr 15:65-8.

[12] Squatting or Western Toilet- A Review Dr. Hitender Suri1, Dr. Deepika Suri2, Dr. Kamalpreet Bansal3 https://jamdsr.com /uploadfiles/23VOL8ISSUE11P102-10n4.20201112115109.pdf .